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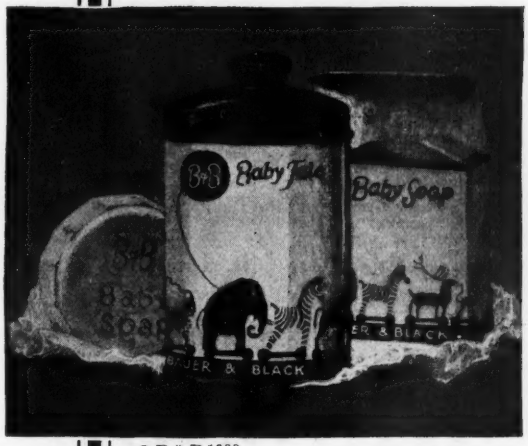

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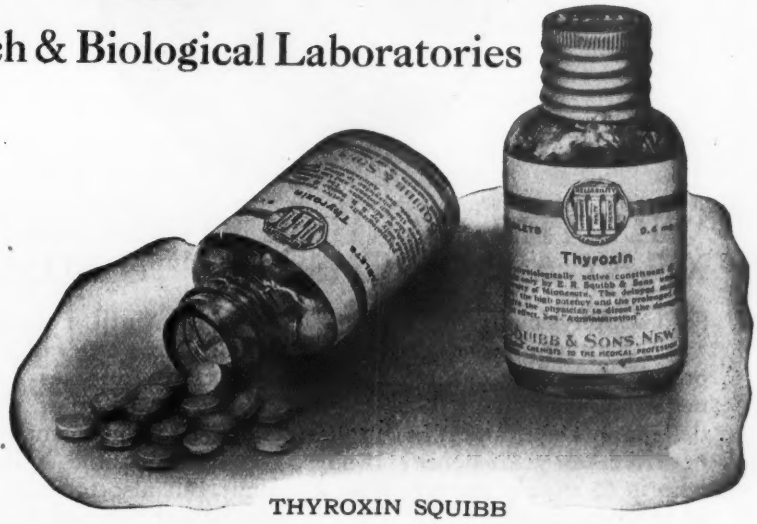

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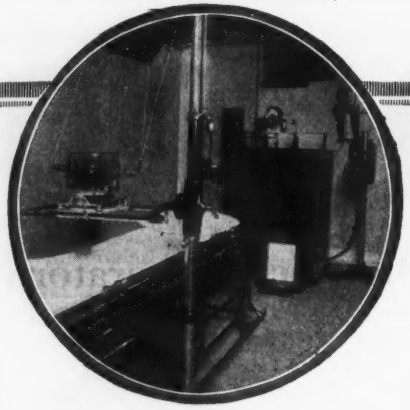

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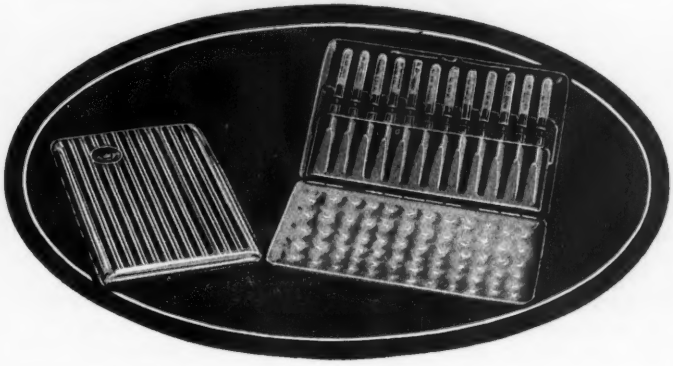

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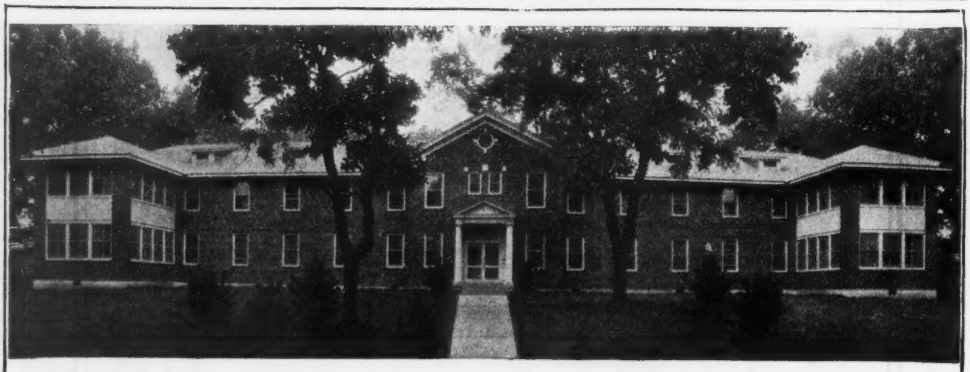

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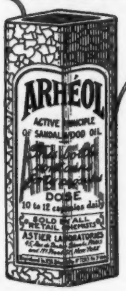

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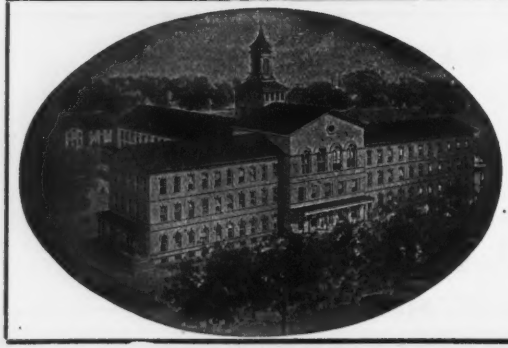

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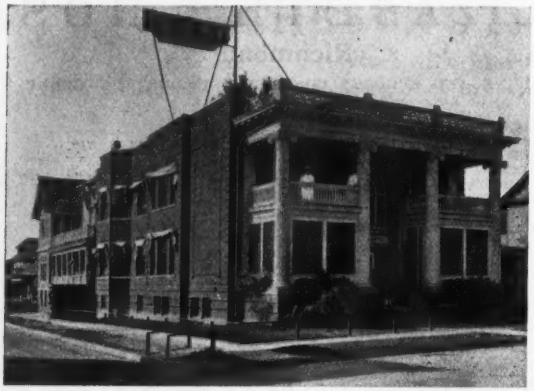

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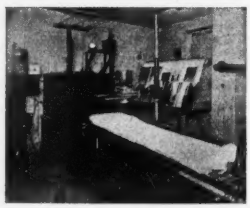

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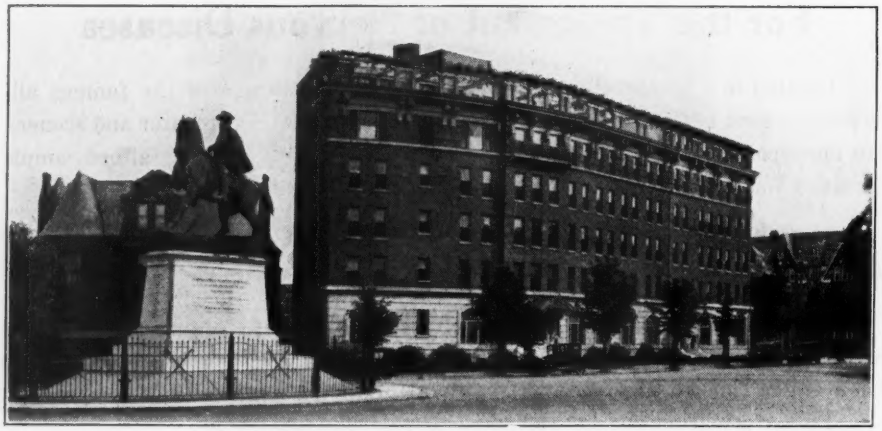

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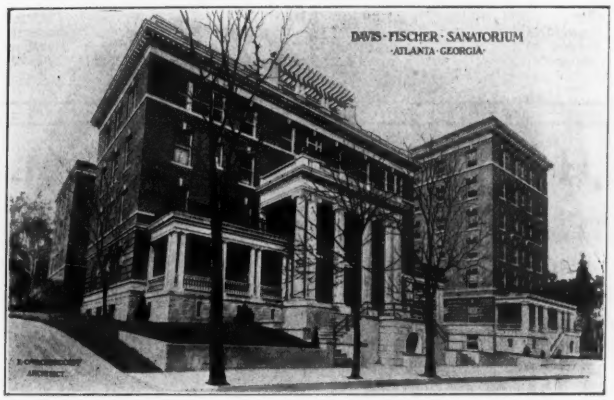

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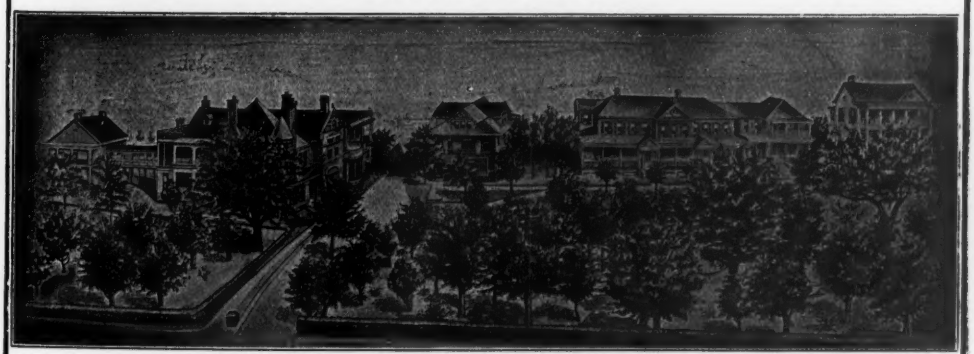

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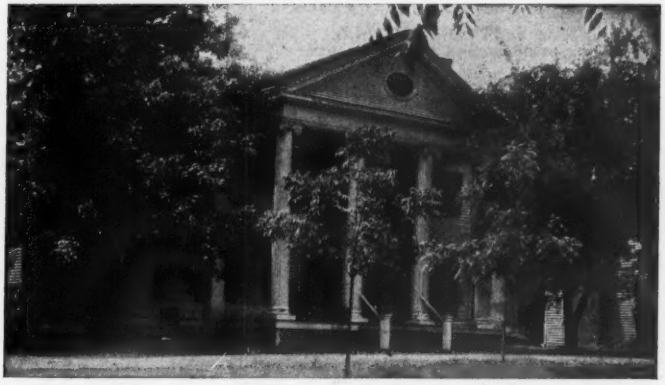

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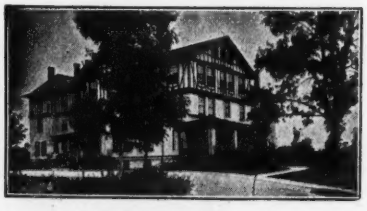

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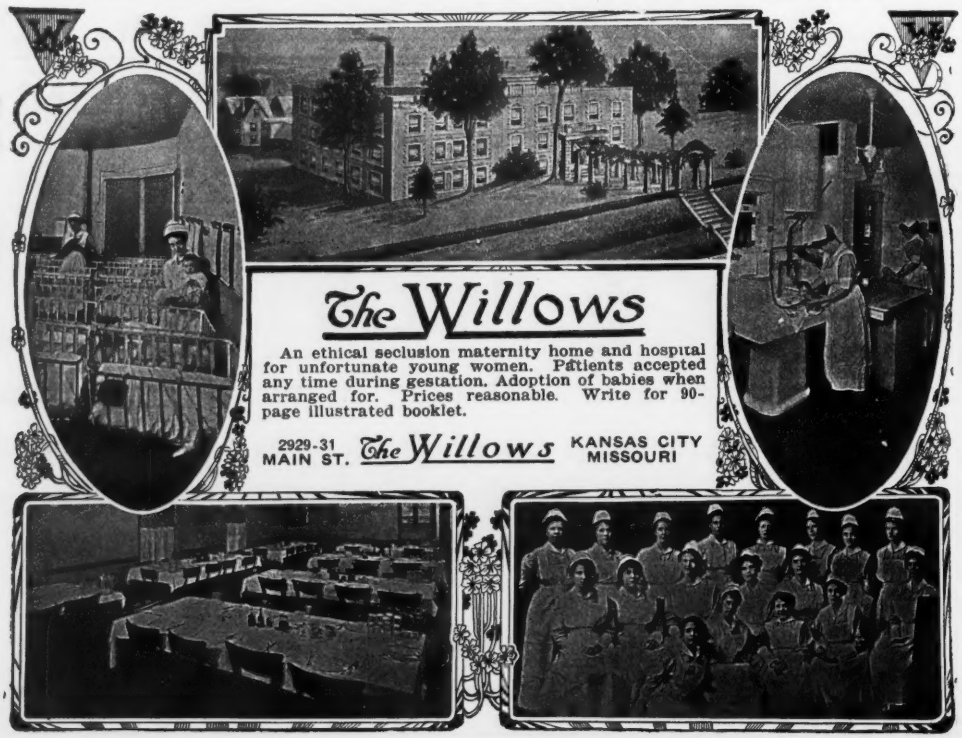

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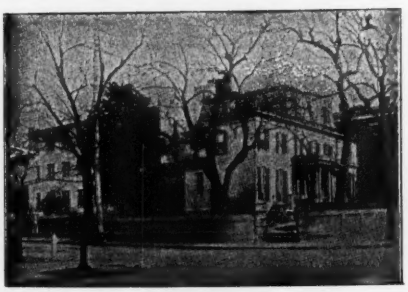

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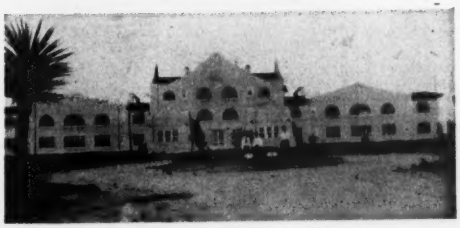

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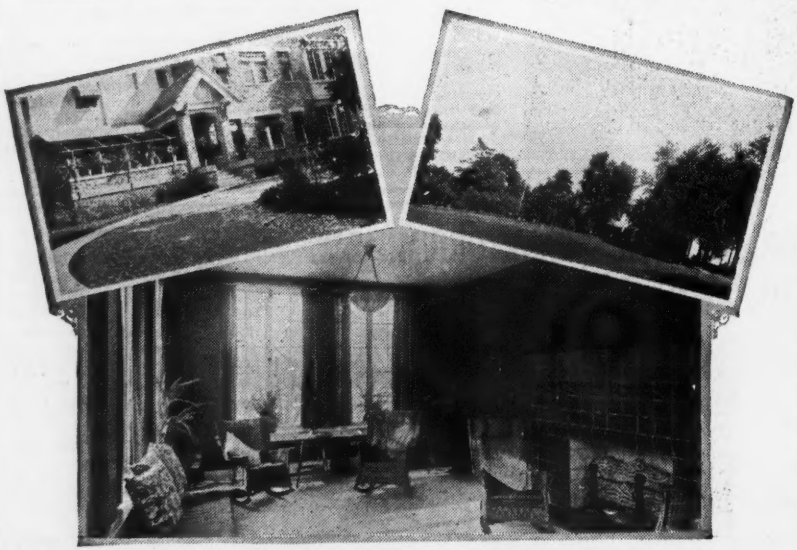

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Volume XV FEBRUARY 1922 Number 2

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

A DISCUSSION OF THE NEWER METHODS IN THE TREATMENT OF DIABETES*

BY ELLIOTT P. JOSLIN, M.D.,
Boston, Mass.

One by one the mysteries are dropping out of the treatment of diabetes. Scarcely a generation ago every doctor, like his grandfather before him, gave drugs and guessed at the diet. If by luck it was suitable he ascribed the benefit to the drug and then wondered why it failed the next time. Today most American doctors have learned the lesson that it is not the drug but the diet which does the good. It is a great advance, of a greatness indeed as yet hardly appreciated. Quite recently two patients appeared in my office after "traveling in a foreign land," the one having been given antipyrin and codein for a glycosuria of pregnancy and the other with a medicated suppository of unknown composition and a "safe, starch-free" bread, which analysis showed to contain 35 per cent reducing sugar! Quantitative knowledge of the diet and the urine has solved the mystery of diabetic drugs.

It is easy to recall, as house pupil at the Massachusetts General Hospital, in 1895, the astonishment of the relatives when notified that a diabetic patient, who had recently entered in good condition, was passing into coma. The frequency with which sudden death resulted from the inauguration of treatment gave sensitive spirits a nightmare when a new diabetic patient applied for advice. What a mystery it seemed! Today any educated diabetic patient, mind you, not doctor, would instantly give the reason. The man's carbohydrate was suddenly withdrawn and the fat in his diet suddenly greatly increased. Such was the treatment which accounts for the cases in the literature of galloping diabetes, for hospital mortalities of 27 per cent, for coma as a cause of 90 per cent of the deaths of those cases who succumbed in the first year of the disease. Fat is the chief source of the acid bodies, and if fat is given in excess when carbohydrate from one source or another is not being oxidized in the body, coma results. All this is commonplace knowledge. There is no mystery about it.

If coma were due to acid intoxication, alkalis should save the patient, but they frequently fail to do so. More cases have recovered without alkalis than with them in my series of cases. It is known that even when the blood is brought to a normal alkalinity coma continues. The etiological mystery of acid intoxication is cleared away to a large degree, but not the therapeutic. It is, however, known that simple measures which aid elimination by kidneys and bowels, conserve warmth and strength, and protect the patient from additional poisoning by fat, if instituted early, will allow nearly all patients to recover from acidosis without any medication. In the last 525 diabetic cases of my series treated at the New

*Read in Section on Medicine, Southern Medical Association, Fifteenth Annual Meeting, Hot Springs, Ark., Nov. 14-17, 1921.

England Deaconess and Corey Hill Hospitals there have been four deaths from coma. None of these 525 patients has had alkalis, but they have been protected from acidosis by the rules just given. Fifteen cases of acidosis are known to have recovered without alkalis, although the severity of the acidosis reached a stage of 18 mm. Hg tension of CO_2 in blood or expired air.

All the three advances named, banishment of drugs, recognition of fat as the cause of sudden coma and treatment without alkalis, represent no startling discovery, but are simply the logical consequence of the appreciation of the necessity of accurately comparing the carbohydrate, protein, and fat ingested by the patient with the quantity of sugar and acid excreted in the urine. For this comparison the necessary knowledge has been available for years, but has been utilized by progressive souls like Cantani, Naunyn, von Noorden, and a few others, whose insistence on quantitation of not merely carbohydrate, but also every food that passed the lips has been accepted by me as the corner-stone of treatment since 1914.

There remain the mysteries of the diet. The pranks and vagaries which this has played, even in the hands of the very elect, surpass those noted with drugs or the direful effects of hospital treatment. With milk this patient was apparently cured, with potatoes that, but with a third both failed. Oatmeal in inordinate amounts banished sugar from a severe case, but when added to the diet of a mild case even in small quantity brought glycosuria back. This very year the results reported with the low carbohydrate, low protein, and high fat diet of Newburgh and Marsh arouse wonder, just as the occasional experience that certain patients show less and less sugar in the urine the more they are fed. Gradually during this last decade the explanation of all these peculiar diets has been forthcoming, and recently has been elucidated most clearly by Woodyatt, though already discussed to some degree by others. He has shown that if one estimates the total glucose-forming material of the diet to be made up of all the carbohydrate, 58 per cent of the protein, and 10 per cent of the fat, these bizarre diets become simplified. A definite question yet to be settled is the relative importance of the total glucose, of its distribution between carbohydrate, protein, and fat, and of the total calories. At any rate, Woodyatt's clarifying exposition of the origin of the total carbohydrate and total fatty acids of the food, combined with an understanding of caloric values, has settled most dietetic riddles.

Empiricism leaps where science walks; and diabetic patients were fortunate to have a Guelpa courageous enough to fast patients and an Allen sufficiently grounded in his literature to correlate this procedure, as well as similar attempts by others on a lesser scale, with observations upon the value of undernutrition which his skillful work afforded.

Undernutrition revolutionized diabetic treatment. This is evident from the results of investigations upon 113 cases of diabetes at the Nutrition Laboratory of the Carnegie Institution in Boston carried on between 1908 and 1917. Prior to June, 1914, when undernutrition was inaugurated in this series, patients were overfed. The average metabolism of the 27 cases before that date was plus 13 per cent, or if based upon experimental days, 31 calories per kilogram body weight. After June, 1914, the average metabolism for 89 cases had dropped to minus 7 per cent, or 24 calories per kilogram body weight. The range of the average metabolism of cases at the extremes of these two groups was between plus 31 per cent in the first and minus 35 per cent in the second. Before June, 1914, the average pulse of the diabetic subjects was 71. After June, 1914, it was 63. A comparison of the urinary nitrogen of the patients in the two epochs is supporting evidence of the change in methods. For this purpose, analyses of urinary nitrogen representing 1,400 days are available. Prior to 1914 the nitrogen excreted per kilogram body weight was 0.265 grams; or calculated for an individual weighing 60 kilograms, 15.9 grams. After June, 1914, the average urinary nitrogen excreted was 0.185 grams, or for an individual weighing 60 kilograms, 11.1 grams. Before June, 1914, the average respiratory quo-

tient was 0.73, and after June, 1914, 0.77, showing the preponderance of fat consumed before June, 1914, as compared with the later period. Here were changes truly revolutionary, yet not mysterious.

The results of this alteration of treatment have been profound. The mortality at the Massachusetts General Hospital was 28 per cent from 1898 until 1914; during the year 1920 it was 2 per cent. Of my own series of 525 cases treated at hospitals since April, 1919, there have been 11 deaths, or a mortality of 2 per cent. Today with little fear treatment can be undertaken. Diabetic coma in a hospital is extremely rare. Children live fully three times as long as they did prior to June, 1914, and it is conservative to state that the duration of the disease in a young adult is extended at least one-half. Already in 1899, the careful application of Naunyn's methods allowed a diabetic of sixty or over to complete his expectation of life, so that individuals of 60, and preferably of 50, or more years should be excluded from comparisons of the value of different types of treatment.

Undernutrition alone does not account for all this change, but it is the factor of greatest importance. The greater accuracy in studying cases which the application of the doctrine of undernutrition involved helped much. Better surgery has contributed a great deal, due largely to the abandonment of ether and chloroform. The mistake must not now be made of discarding achievements which are incomparable in the history of the disease. Yet, while realizing in the highest degree what undernutrition has done for the diabetic, it is now time to reckon the toll which it has levied upon him, to judge whether it be or be not excessive and to attempt to meet more securely the queries of those who protest against the severity of the treatment.

Undernutrition means fasting. If an individual fasts, he loses body tissue, because life is only maintained by the oxidation of carbohydrate, protein, and fat. So far as is clearly known at present, it is immaterial whether these components are furnished from within or without the body. Newburgh and Marsh have helpfully emphasized this point. The effects wrought upon the body by a fast are known. At the Nutrition Laboratory a healthy man fasted 31 days. During these 31 days he lost 13.2 kilograms, or 29 pounds, representing 22 per cent of his body weight—a fifth of the man. The average decrease in body weight each day was 0.7 per cent. When a diabetic patient is fasted for a day it is well to recollect that there is every reason to believe that he will lose as much proportionately, and if he fasts a second day another 0.7 per cent of body tissue goes. It may be desirable to lower the weight of a diabetic slightly, but it can hardly be advantageous to lower the weight extremely, even granting that so great a loss of body protein is not injurious. How does one know that with the loss in body tissue the pancreas does not suffer as much or even more than other parts of the body? Empirically we know that the diabetic underfed is safer than the diabetic overfed, but it is still speculation as to why this is so and whether the pancreas functions better, worse, or the same with the resulting change in weight.* At any rate, undernutrition has taught the lesson that one can not safely overfeed a diabetic.

A loss of 0.7 per cent of body tissue in a day can not be made up by doubling the food the following day. The ravages of a day's fast are not quickly replaced by a diabetic. It is a basic principle now acknowledged by all that patients should not be overfed. In consequence one would hesitate to give a diabetic, even if it were apparently well borne, more than 5 per cent, or at the most 10 per cent, extra food. Even if this could be tolerated day in and day out, and even though later fast days or half days were unnecessary, it would require from twenty to ten days to make up for a single day of starvation, and the loss of weight entailed by five days of fasting would probably require nearer 100 days and very likely even a year. It is worth while to sacrifice weight to get the diabetic sugar-free, but the greatest

*Considerable information upon this topic is to be found in an article by Krieger, Ztschr. f. Ang. Anat. u. Konstitutionslehre, 1920-21, 7, p. 87. Also see Meyers, Jour. Med. Research, 1917, 36, p. 51.

possible precaution should be taken not to sacrifice weight needlessly.

The character of the body tissue lost in fasting is of significance. It is by no means inert fat alone. L. lost during his 31 days of fasting 277 grams nitrogen, or 9.0 grams nitrogen per day, representing about 60 grams body protein. Utilizing the metabolic data acquired in his case, it can be computed that each kilogram body weight lost was the approximate equivalent of 3,243 calories furnished by proteins 126 grams, and fat 269 grams, carbohydrate 15 grams. Water makes up most of the balance.

These figures are not so very dissimilar to those which represent the composition of the body. The average metabolism of L. was 24 calories per kilogram and of the 113 diabetics 26 calories per kilogram even when abed and quiet. Diabetics have no immunity to loss of weight by fasting.

While one stands aghast at the cost of undernutrition and is only held to the use of this method by the absolute proof of the better results which it has produced as compared with overnutrition, the naked statement of the above facts shows how great is the need for improvements in treatment. All are anticipating the brilliant discovery of a preparation which will take the place of the islands of Langerhans, and do for diabetes what the thyroid has done for myxedema, and each one hopes that unlike Moses he may not only look toward the promised land, but actually live in it. Pending that occasion it is cheering to see how improvement can take place, and to work in that direction.

It is reasonable to suppose that the methods first employed in the use of fasting should be modified in various ways. Almost before his paper was published Dr. Allen was kind enough to point out to me that he had given up the employment of alcohol in the preliminary days of fasting, and last month, before the Pennsylvania State Medical Society, he reaffirmed the statement and added that he made no use of alcohol in the treatment of diabetes. In this practice the writer concurs.

Fasting can be employed at the beginning of treatment with most cases, and it is seldom that any but good results develop. To guard against all danger from its use in severe, long-standing, complicated, obese and elderly cases, as well as in all cases with acidosis, it was recommended that before the actual fast a preliminary period of dieting be adopted. During this interval, in order to avoid the danger of acid poisoning, the omission of fat was proposed and the subsequent decrease of protein and of carbohydrate. In reality this represents partial fasting combined with a fat-free diet. With these modifications the results have been excellent. Frequently it was found that the half fast which the omission of fat involved sufficed to make the urine sugar-free.

Since the vast majority of diabetics must be treated by the general practitioner, the writer proposed a system of test diets which embodied the above plan for gradual dietetic curtailment in the hope of simplifying treatment still further, removing all danger and making diabetic treatment easier to carry out in the home and incidentally, in the hospital as well. In test diet 1, the carbohydrate was reduced about one-half to two-thirds of that ordinarily taken in health, the protein little changed, but the fat eliminated. The remaining four test diets represent gradual transitions to fasting. These test diets have proven useful and have contributed to the low mortality of 2 per cent in 500 cases. Hesitation, therefore, is felt in changing them for fear their replacement by others will not be so effective for good. The line of their needed revision is indicated from the recent work of Dr. Muryama at the Deaconess Hospital, in which he showed that the loss of nitrogen of five patients upon these diets was very considerable, amounting to between 13.2 grams and 7.8 grams per day calculated per individual of 60 kilograms body weight. A comparison of the effects of fasting with this slower method of elimination of fat and gradual reduction of carbohydrate and protein was made a year ago by my assistant, Dr. W. B. Breed. He showed that, of two such groups of 30 cases each, those treated by

early elimination of fat and gradual reduction of carbohydrate and protein in contrast to immediate fasting were able to leave the hospital somewhat earlier and yet with as many calories in the diet. The comparison thus demonstrated a slight superiority in the method of gradual reduction of the diet over actual fasting, and while designed primarily to avoid the danger of acidosis at the same time conserved calories for the patient.

Form J. 4. Thomas Groom & Co., Inc., 105 State St., Boston, Mass.

DIABETIC DIETS

Diets with which to become Sugar free	Diet in Grams				Test Diets														Name of Diet
	Carbohydrate	Protein	Fat.	Calories	5% Vegetable	Orange	Oatmeal	Shredded Wheat	Uneeda	Potato	Bread	Egg	Cream 20% fat	Bacon	Butter	Meat	Fish	Skimmed Milk	
T. D.1	189	89	15	1247	300	300	....	1	.....	240	90	....	.....	....	....	90	120	480	1
T. D.2	102	58	0	640	300	300	....	1	.....	120	....	....	.....	....	....	....	180	300	2
T. D.3	64	33	0	388	300	300	....	....	.....	60	....	....	.....	....	....	....	90	240	3
T. D.4	36	27	0	252	300	200	....	....	.....	....	....	....	.....	....	....	....	90	120	4
T. D.5	15	5	0	80	300	50	....	....	.....	....	....	....	.....	....	....	....	....	....	5
Maintenance Diets					**Carbohydrate (C)**							**Protein and Fat (PF)**							
C1 + PF1	10	11	6	138	300	.....	....	....	.....	....	....	1	.....	....	....	....	....	....	1
C2 + PF2	22	13	18	302	300	100	....	....	.....	....	....	1	60	....	....	....	....	....	2
C3 + PF3	32	24	24	440	600	100	....	....	.....	....	....	2	60	....	....	....	....	....	3
C4 + PF4	42	29	39	635	600	200	....	....	.....	....	....	2	60	30	....	....	....	....	4
C5 + PF5	52	32	53	813	600	200	15	....	.....	....	....	2	60	30	15	....	....	....	5
C6 + PF6	63	43	65	1009	600	200	30	....	.....	....	....	2	90	30	15	30	....	....	6
C7 + PF7	73	51	70	1126	600	300	30	....	.....	....	....	2	90	30	15	60	....	....	7
C8 + PF8	83	59	87	1351	600	300	30	....	2	....	....	2	90	30	30	90	....	....	8
C9 + PF9	96	62	93	1469	600	300	30	½	2	....	....	2	120	30	30	90	....	....	9
C10 + PF10	107	63	93	1517	600	300	30	1	2	....	....	2	120	30	30	90	....	....	10
C11 + PF11	131	75	98	1706	600	300	30	1	2	120	....	2	120	30	30	120	....	....	11
C12 + PF12	155	79	98	1818	600	300	30	1	2	240	....	2	120	30	30	120	....	....	12

Food	Weight in grams	Approximate equivalent
Orange	300.	One and one-half large size
5 per cent vegetables	300.	Three moderate portions
Skimmed milk	480.	One pint 16 ounces
Fish	120.	Two small portions
Potato	240.	Two medium-sized potatoes
Meat	90.	One moderate portion

Food	Weight in grams	Approximate equivalent
Bread	90.	Three small slices
Oatmeal dry wgt.	30.	One large saucerful
Cream	60.	Four tablespoonfuls
Bacon	30.	Four crisp strips
Butter	30.	Three medium portions

TABLE 1.

The test diets employed at the hospital to render patients sugar-free proved so satisfactory that it appeared desirable to provide a standardized method of treatment for the subsequent days, both for use in the hospital and for practitioners who can not spend the time needed to study out the exact quantities of carbohydrate, protein and fat required day by day by their patients. The test diets as well as the maintenance diets for later use are shown in Table 1.

The test diets are designed for the period during which the patient becomes gradually sugar-free. On successive days advances can be made from test diet 1 to test diet 5, and if on the fifth day the patient is not sugar-free, fasting can be employed for one or more days.

The maintenance diets are for use as soon as the urine of the patient is free from sugar. If this occurs as a result of test diet 5, the patient begins with maintenance diet C_1 P F_1. The actual articles of food representing the carbohydrate in the diet for the first day are given under the heading of carbohydrate, for convenience described C_1, C_2, C_3, etc. The articles referred to under protein and fat are under the heading which, for the same reason, is described as PF_1, PF_2, PF_3, etc. Certain cases of diabetes can proceed steadily day by day from C_1 PF_1 to C_{12} to PF_{12} without showing sugar. If sugar does appear in the urine, drop back two days in the carbohydrate group, wait until sugar-free, then advance in the protein and fat group until sufficient calories are obtained. Thus, if sugar shows on C_7PF_7 the diet prescribed would be that included in C_5PF_7, and thereafter progression could be made in the PF group until twenty-five to thirty calories per kilogram body weight were furnished the patient.

Occasionally the patient becomes sugar-free on test diet 2, 3, or 4. It is then unnecessary to begin with maintenance diet C_1 PF_1, but instead with a maintenance diet which contains a value for carbohydrate similar to that of the test diet upon which the patient became sugar-free.

If the protein and fat are too high for the individual on a given day, it is easy to

advance the carbohydrate and decrease to an earlier day on protein and fat.

The plan is arbitrary and the majority of cases will demand some modification. On the other hand, the definite plan is advantageous because it enables patient or nurse to see in advance the general course of treatment. At the Deaconess and Corey Hill Hospitals these diets have

Water, clear broths, coffee, tea, cocoa shells and cracked cocoa can be taken without allowance for food content

FOODS ARRANGED APPROXIMATELY ACCORDING TO CONTENT OF CARBOHYDRATES.

	5%		10%	15%	20%
	* Reckon average carbohydrate in 5% veg. as 3%—of 10% veg. as 6%				
VEGETABLES (fresh or canned)	1%-3%	3%-5%	10% *	15%	20%
	Lettuce	Tomatoes	Str. Beans	Green Peas	Potatoes
	Cucumbers	Brussels	Pumpkin	Artichokes	Shell Beans
	Spinach	Sprouts	Turnip	Parsnips	Baked Beans
	Asparagus	Water Cress	Kohl-Rabi	Canned	Green Corn
	Rhubarb	Sea Kale	Squash	Lima Beans	Boiled Rice
	Endive	Okra	Beets		Boiled
	Marrow	Cauliflower	Carrots		Macaroni
	Sorrel	Egg Plant	Onions		
	Sauerkraut	Cabbage	Green Peas		
	Beet Greens	Radishes	canned		
	Dandelion	Leeks			
	Greens	String Beans			
	Swiss Chard	canned			
	Celery	Broccoli			
	Mushrooms	Artichokes			
		canned			
FRUITS	* Ripe Olives (20% fat)		Watermel'n	Raspberries	Plums
	Grape Fruit		Strawberr's	Currants	Bananas
			Lemons	Apricots	Prunes
			Cranberries	Pears	
			Peaches	Apples	
			Pineapple	Huckleberr's	
			Blackberr's	Blueberries	
			Gooseberr's	Cherries	
			Oranges		

1 gram protein, 4 calories.
1 " carbohydrate, 4 "
1 " fat, 9 "
6.25" protein contain 1g. nitrogen.

1 kilogram=2.2 pounds.
30 grams g or cubic centimeters c.c. =1 ounce.
A patient "at rest" requires 25 calories per kilogram

(30 grams) 1 oz. CONTAIN APPROXIMATELY	CARBOHYDRATES G.	PROTEIN G.	FAT G.	CALORIES
Oatmeal, dry wgt.	20	5	2	118
Shredded Wheat	23	3	0	104
Cream, 40%	1	1	12	116
" 20%	1	1	6	62
Milk	1.5	1	1	19
Brazil Nuts	2	5	20	208
Oysters, six	4	6	1	49
Meat (uncooked, lean)	0	6	3	51
" (cooked, lean)	0	8	5	77
Chicken (cooked lean)	0	8	3	59
Bacon	0	5	15	155
Cheese	0	8	11	131
Egg (one)	0	6	6	78
Vegetables 5% group	1	0.5	0	6
Vegetables 10% group	2	0.5	0	10
Potato	5	1	0	28
Bread	18	3	0	84
Butter	0	0	25	225
Oil	0	0	30	270
Fish, cod, haddock (cooked)	0	6	0	24
Broth	0	0.7	0	3

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TABLE 2.

systematized treatment and have been of distinct service.

In the December number of the *Archives of Internal Medicine* for 1920, Newburgh and Marsh published a paper in which they recommended the employment of a high fat, low protein and carbohydrate diet for *all* diabetics without selection. Even when patients were immediately placed upon this diet they observed no serious acidosis. The patients eventually became sugar-free, those investigated maintained a nitrogen balance, and the authors were convinced that with this diet patients could resume the ordinary activities of life.

All praise should be given to Newburgh and Marsh for their courage in inaugurating a departure from routine methods and it is hoped that their claims for the treatment proposed will be substantiated. This is necessary before such radical departures in the care of diabetics should be universally adopted.

The treatment is of such recent origin that a final conclusion regarding its merits can not be passed today. Certain data, however, have been accumulated by Newburgh and Marsh, some of which appeared in their original article, and the remainder they were kind enough to place at my disposal. Seventy-three patients underwent hospital treatment during 1918, 1919 and 1920. Of these, 69 were discharged alive, the remainder having died from causes not attributable to the diet. Ten months after the paper was published, a survey was made of the patients discharged, and 43 were traced. Of these, 21 have died and 22 were known to be alive. The further course of these 22 living patients will be of value in determining the efficacy of the treatment and their subsequent career will be awaited with interest.

A high fat diet combined with a low carbohydrate diet is not new in the treatment of diabetes. It represents the Naunyn type of treatment. The difference between that treatment and the Newburgh and Marsh treatment lies in the extremely low quantity of protein employed and in the reduction of total calories at the beginning of treatment. All past evidence indicates that the low carbohydrate high fat ratio was responsible for the formerly high mortality from acidosis, and it is yet to be proven that the reduction in protein will prevent this mortality in the future. A greater limitation in calories than that proposed by Newburgh and Marsh will undoubtedly help their method much. That the patients treated by this method did not promptly go into coma as might have been

expected appears due to the low caloric value of the diet. Despite the comparatively high fat which it contained, it represented but 15 calories per kilogram body weight for the ordinary individual. The method of Newburgh and Marsh in this respect resembles my own more than that of Allen, but all three methods depend upon undernutrition for their success. Upon this diet the Ann Arbor cases became sugar-free at the end of ten days, more or less, and it is not strange, because by living on half rations they virtually fasted for five days. There may be an exceptional case who will become sugar-free by this method and not by fasting, and such a patient I saw, but the past history of the case during the period of undernutrition was not accurately known.

The explanation of the lack of acidosis, even though low carbohydrate and high fat were given the patient, is not absolutely clear, but it would appear to be that during a period of undernutrition alarming acidosis is less likely to develop. The evidence is yet unsatisfactory that these diets, which represent a proportion of fat to carbohydrate twice that considered safe by Woodyatt, will be borne when a maintenance diet is given. Furthermore, experience teaches that a diet which contains so little carbohydrate and so high a quantity of fat palls upon a diabetic after five years and today all diets must be arranged with the idea that the average patient will live at least seven years. It is striking that the average duration of the disease of twenty-four of my fatal cases whose disease was first discovered by insurance was twelve years.

The ratio of carbohydrate to fat in the normal diet is about 6 to 1, and the protein which it contains not far from 1 gram per kilogram body weight. It is reasonable to believe that the nearer the normal ratio of six carbohydrate to one fat can be preserved with normal blood and urine, and retention of weight, the better it is for the individual, whether diabetic or normal. By the Newburgh and Marsh diet this proportion is completely reversed, and instead of six carbohydrate to one fat their routine diet calls for six fat to one carbohydrate. It was because of this ratio and experience with cases treated with it in earlier days, though with higher protein, that for the present the writer must hold in abeyance an approval of this type of treatment. With such ratio the writer found that his patients frequently met an early death.

Undernutrition, no matter what may be the exact form in which it is employed, will render the urine sugar-free. It is a pretty question for study to determine whether a diabetic will gain carbohydrate tolerance best by means of a high carbohydrate, low fat ratio or with its reverse. Satisfactory conclusions can not be reached today and it would be a great mistake if those interested in these different methods should not pursue them for a while longer in order to compare results.

The problem is simply this: Given a diabetic patient, weight 60 kilograms, who tolerates 1,800 calories, distributed as follows: carbohydrate 130 grams, protein 60 grams, and fat 116 grams. Will this diabetic be better off seven years from now starting upon this diet than if he were placed upon a diet of equal caloric values, but arranged with carbohydrate 30 grams, protein 40 grams, fat 170 grams? That is the vital question. It is granted that the diabetic upon the former plan may lose tolerance in the course of time and be compelled to lower the carbohydrate and protein and increase the proportion of fat. Even so he has this resource to fall back upon. If he begins with a low carbohydrate and high fat diet, what is there left when tolerance fails? It can hardly be argued by those who favor a low carbohydrate and high fat diet at the start that one should attempt to raise the patient's carbohydrate tolerance as time goes on, because, though he had it at the start, no advantage was taken of it.

The low protein proposed by Newburgh and Marsh has been most useful in a considerable number of cases. All agree that the protein in the diet of an adult diabetic should be within the limits of 1.5 grams to 0.7 grams per kilogram body weight, and in general the lower rather than the higher quantities appear preferable. Recently, a patient who was kept

sugar-free with difficulty became sugar-free permanently when the protein was reduced to the lower limits, 0.7 grams per kilogram body weight, and the calories kept the same. Gradually this patient has increased his tolerance for carbohydrates from 13 grams to 21 grams, and the ratio of carbohydrate to fat, which was once 1 to 6, is now 1 to 4, a gratifying exposition of the possibility of increasing carbohydrate by the reduction of protein and of rectifying the abnormal carbohydrate-fat ratio. With this patient calories are kept constant and will be kept constant at not more than 25 per kilogram body weight until a carbohydrate-fat ratio of at least 1 to 3 is attained.

Such are some of the tendencies existent today in the treatment of diabetes. In what direction should one look for treatment of this? Unquestionably first of all in the improvement of the care of patients in their own homes. One can not expect to lower a hospital mortality of 2 per cent much, if any, but one must lower the home mortality, so that patients under sixty years of age, as well as over sixty, may look forward to the completion of their expectation of life.

If the duration of diabetes accidentally discovered by insurance companies is twelve years, it lies in the power of every practitioner in the United States not only to duplicate these results for similar age periods, but to surpass them, because it is his duty to detect diabetes not by accident, but by design. Thereby he will gain an advantage over the cases found by insurance companies in beginning treatment at an earlier stage.

The incipient case of diabetes is the easy one to treat, but the obligation to treat the early case thoroughly and well is even greater than in tuberculosis.

Secondly, it is imperative that clinicians should control their various types of treatment by follow-up methods over periods of years. There are advantages in all kinds of treatment. The one who originates a new policy is the one best able to find the fault in it. Facts regarding treatment, etiology, classification, are all that are needed to clear up many more diabetic mysteries. Observe, I do not say discoveries, but the simple accumulation of facts, which, when compiled, will convince and point out the right path.

Third, and in conclusion, not to the general practitioner, not to the clinician are the anxious eyes of the parents of the little diabetic child turning today, but to the laboratory worker; to your Opie and Shaffer, to our Benedict and Cannon and Folin, and a host of others, chemists, physiologists and pathologists unostentatiously active here and there throughout the country. Are you and I doing what we can to encourage these men who seldom have the gratitude of patients to reward their patient endeavor? Do we tell our patients to help them and to foster their laboratories? Practitioners, clinicians, scientists, diabetes is a disease which needs the help of you all.

DISCUSSION

Dr. James S. McLester, Birmingham, Ala.—To paraphrase a well known advertisement, when we think diabetes we think Joslin. In the management of this disease Dr. Joslin has taught us two great things: first, he has demonstrated the value of painstaking precision, and second, he has shown that we must educate the patient.

I gather that Dr. Joslin fears the effect of too much fat in the diet and that he is inclined toward an intake low in fats. In this connection we can not, as Woodyatt has recently indicated, afford to lose sight of the endogenous factor of food supply and particularly of the fats included therein. For example, the average starving individual at rest will metabolize sufficient of his own tissues to liberate about 1,500 calories. If he is well nourished this will come largely from his body fats and, to a smaller extent, from his proteins: say, 125 gm. of fat and 75 gm. of protein; or, if there is no body fat, he will simply draw heavily upon his proteins. To the metabolic processes it is the same whether these foodstuffs come from the patient's own tissues or enter through his mouth.

The nature of this endogenous food supply is beyond our control. Its amount, in most instances, is subject to control. Meet the patient's minimal metabolic requirements with a diet of sufficient caloric value and the endogenous food supply is stopped. In the diabetic, however, because of his restricted ability to metabolize sugar, it is difficult to meet these requirements without permitting in the diet a fairly liberal amount of fat. If we fail to meet these requirements he gets the fats, anyhow.

There is another aspect of this problem worthy of consideration. Rather than think in terms of dietary foodstuffs, we should accustom ourselves, as Woodyatt advises, to think in terms of ultimate chemical metabolism. For example, we have come to fear fats above all else because of

the acetone bodies which they produce, but we fail to realize that proteins in the process of disintegration yield also a not inconsiderable amount of these bodies.

Turning to the question of carbohydrates, we should in like manner include in our dietary reckonings, endogenous as well as exogenous, the fact that proteins yield 50 per cent of glucose and fats 10 per cent of glucose. Thus, the thin individual on a subcaloric diet, who metabolizes, say, 50 gm. daily of his own body protein, is forced to deal with an additional 25 gm. of glucose, an amount sufficient to topple him over if he has already reached the upper limits of his carbohydrate tolerance. He would be spared this additional burden of glucose and his body tissues would be saved could we add to his diet sufficient fats to meet his minimal metabolic requirements.

When Dr. Joslin tells of the great prolongation of life in the diabetic which has accompanied this modern treatment, he offers a wonderfully convincing argument for the dietary methods which he has adopted, and we must admit that caution tells us to proceed slowly. Considering the factors of which I have just spoken, however, one can not help wondering if we are not about to take hold of still more precise methods, and by these methods to bring to the diabetic still greater comfort and prolongation of life.

Dr. I. I. Lemann, New Orleans, La.—It seems to me there are several very important lessons which we should take home from the stimulus of Dr. Joslin's paper. In the first place, there is the stimulus of those men who are working particularly in diabetes to continue exact and prolonged observations of their patients and all laboratory findings. Equally important is the lesson that the general practitioner should take home with him that, after all, the care of the diabetic is common sense and not beyond his capacity. I am speaking now of the general run of diabetic patients. Fortunately it is a fact that the majority of diabetic cases are mild. The control of mild diabetics is in the hands of the general practitioner, and the control of their diet is not so complicated an affair as to be beyond his ability. While a great deal is to be gained by schematization, such as Dr. Joslin has proposed on the cards he has enclosed in his envelope, still we must not lose sight of the fundamental importance of individualization in the handling of diabetic diets. I think Dr. Joslin himself means to emphasize that in the handling of the schemata that he proposes. Many of these things that the general practitioner has heard this morning and has read and has heard repeatedly perhaps, at first glance impress him with the idea of mystery and of ultrascientific training, and the need of a laboratory for blood sugar work and metabolism work. But the facts are that he will learn by the handling of diabetic patients, with his caloric value tables, and with some such scheme as Dr. Joslin has proposed. Any one who will take such tables as these and plot out his results on tables or blanks similar to Dr. Joslin's will soon learn the system. It is remarkable how quickly all internes in the hospital learn to manipulate these diet schemes. There is no great mystery about it.

The next point I wish to make is that there is undoubtedly an increase of carbohydrate tolerance in the diabetic after he has lost weight. It has been my observation several times that diabetics who were formerly obese, and who either during the course of their disease untreated or during treatment have become very much less stout, have a higher carbohydrate tolerance. It is much easier after they have lost weight to keep them sugar-free.

In conclusion, I wish to suggest to Dr. Joslin that perhaps the hospital statistics may be fallacious to this extent. We are seeing more diabetics at the hospital. More diabetics are willing to go to the hospital to be treated than formerly. Formerly, the attitude of the average patient was: "What is the use of going to a hospital to be treated for a short time if we have a condition that is incurable, and that we shall eventually have to handle at home?" The 2 per cent mortality of hospital statistics, therefore, may be to a certain extent fallacious, because a larger proportion of mild cases than formerly go to the hospital.

Dr. L. F. Barker, Baltimore, Md.—Dr. McLester and Dr. Lemann have paid tribute to Dr. Joslin for the part he has played in bringing about a genuine revolution in the management of diabetes, and in that tribute I should like to concur. There has, perhaps, been nothing more striking among recent contributions to the applied science and to the art of clinical medicine than this newer work on diabetes and its management.

One of the things I learned from Dr. Joslin some years ago which has been to me of the greatest help in practice, was the method of prevention of acidosis during dietetic treatment by removing the fats from the diet before reducing the amounts of protein and of carbohydrates given. If one places the patient for a day or two on proteins and carbohydrates, say some boiled fish, some green vegetables, and an orange, cutting off all the fats, one can then reduce the intake further and even starve the patient without danger of later acid poisoning.

We shall see much less of diabetic coma from now on if this new knowledge is systematically applied.

A second thing Dr. Joslin has taught me is the great importance of obesity as a factor predisposing to diabetes. If we who practice medicine would remember that, after middle life, fat people are very greatly more likely to develop diabetes than are thin people, our patients could be made to profit enormously by it. Dr. Joslin's statistics indicate that after middle life fat people are 19 times as likely to develop diabetes as are thin people!

Von Noorden taught us the great importance of observation and rigid medical control, for two or three weeks preferably in a hospital, of diabetic patients at the beginning of their treatment. Dr. Joslin has adopted this method also and has done us a great service in showing us how best to educate patients regarding the care of themselves after the diagnosis has been

made and the management begun. He has prepared a little manual on diabetes that can be given to patients. It is easy to understand and will serve as a valuable guide to any intelligent layman suffering from the disease. With the supervision of his family physician and the aid of this manual, diabetic patients should make fewer mistakes than formerly. If general practitioners knew and applied all that is contained in that little book prepared for patients, there would be far fewer disasters in diabetes than there are now.

Dr. Joslin referred to the importance of laboratory work for the advance of our knowledge of diabetes. I understand that Dr. MacLeod, a physiologist in Toronto, has been able to prepare an extract from the islands of Langerhans of the pancreas that splits the carbohydrate molecule. If that be true, we have the first step toward the isolation of the chemical substance that splits the sugar molecule. Possibly we may later with this substance do for diabetes mellitus something similar to what we can do with thyroxin for myxedema, and to what we can do with pituitrin for diabetes insipidus.

It must be gratifying to all who live in this country to realize that many of the advances made in the past few years in the management of diabetes have been of American origin. To mention the leading men—Allen, Joslin, Newburgh, Woodyatt and MacLeod—we have a galaxy of names that will surely go down in history in connection with diabetes. We can be proud of the work that medical men in this country are doing.

Dr. Louis Hamman, Baltimore, Md.—I wish to refer to a few points of practical interest. The first of these is so trite that I should hesitate to speak of it were it not that experience has taught me that it is constantly neglected by physicians. In those instances of diabetes that come on insidiously, glycosuria in the early stages occurs not continuously but only after meals. To take advantage of this well known fact it is important that physicians should instruct patients carefully in the manner of collecting the urine to be examined. During the past three years I have as a routine given patients printed slips directing them to empty the bladder before dinner and to collect the specimen of urine to be examined from two to three hours after the meal. A second specimen voided in the morning is also requested. The specimen collected after dinner is more likely to contain sugar than a specimen collected at any other time. I have been surprised at the large number of instances of slight glycosuria detected in this way which would otherwise have been overlooked. A slight post-prandial glycosuria does not always indicate diabetes, but when it is discovered it raises this possibility and demands careful investigation to determine whether or not diabetes is present.

Referring to the statistics of the results of treatment in diabetes, it is important to emphasize a factor that has nothing to do with the scientific aspects of treatment, but it is perhaps as important as these. The factor I refer to is the careful instruction of the diabetic patient in the nature and the control of his malady. Any one who has visited Dr. Joslin's Clinic is bound to come away with the conviction that his excellent results are due as much to the careful instruction of his patients and their hearty cooperation as to the scientific accuracy of his work.

As regards diet in treatment, I agree with Dr. Joslin. I have treated patients in the old days when protein and fat were crowded. I have treated patients upon the Allen principle of undernutrition. And during the past year I have treated many with a diet approaching a maintenance diet consisting of a low protein portion and a large amount of fat balanced upon the relation of available glucose to available fatty acid. This last named method introduced by Woodyatt has decided advantages in many instances, particularly in rapidly making the patient sugar-free without undue loss of weight. However, it remains to be demonstrated that the feeding of large amounts of fat over a long period of time is desirable. The striking advantages of Woodyatt's method in certain instances should not encourage physicians to return indiscriminately to diets very rich in fats.

Dr. Neuton S. Stern, Memphis, Tenn.—The laboratory side of the study of diabetes is simple. All those who have spoken have emphasized the importance of having these patients in hospitals. I do not think it is absolutely necessary to have a patient in the hospital to get very satisfactory chemical results. The Benedict test for sugar is easy. The quantitative test is almost as easy. The ferric chlorid test for the presence of acidosis means the use of one chemical which is already mixed up in the drug store. These tests can be done with the utmost simplicity in any laboratory. Furthermore, if you wish to test for the amount of acidosis, it can be done with simple chemical tests for ammonia in the urine. Dr. Joslin's little manual gives all these things with great detail, showing how easily the work can be done in your own laboratory. If you are really interested in the subject, even if you live in the country, there is no reason why you can not study blood sugar. It requires a very simple apparatus. You may make use of the Epstein method for routine work where you have not the facilities of a larger laboratory. Again, the carbon dioxid in the alveolar air can be studied by the Marriott method. I call your attention to the simplicity of all these methods by means of which you can get a satisfactory idea of the chemistry of the diabetic, even though you are far removed from a hospital.

Dr. J. B. McElroy, Memphis, Tenn.—What strikes me very forcibly is the necessity of having these patients under observation in order to make the necessary investigations when they start out on the treatment, and also to note the little improvement following treatment as Dr. Joslin has emphasized. You will find sometimes that it is difficult to get a patient to confer with you in these respects. Recently, to cite an instance, a patient came to my office who had lost fifty or sixty pounds in weight. He had 5 per cent of sugar in his urine and 0.2 per cent blood sugar, besides a dilated aorta. When I suggested that he stay five or six days in the hospital, he replied: "I am not a sick enough man to go to the hospital."

Dr. Joslin (closing).—Dr. Hamman's statement about the desirability of saving the urine following the evening meal I think is most valuable.

Emphasis has been rightly laid upon the importance of treating patients in their homes. One can treat patients in their homes perfectly well if one will only give the time to it. It takes more time. In the hospital one can talk to a group. In their homes one must talk to each patient individually. However, one can do it perfectly well, and it is really with that in mind that I have used these cards recently of test diets and maintenance diets, so that these patients may know from day to day what to do when I do not see them.

The favorable results of hospital treatment may be in part due to the entrance of milder cases. Of course, the statement is often made to me that only mild cases come to me, and that is why only 2 per cent die. During the year 1920 the Massachusetts General Hospital, a representative institution, with which I have no connection, treated 98 cases of diabetes, and of this number 2 died. In one other hospital in which I do not think the treatment was as good, the mortality was much higher. Yet there was no reason to believe that the other hospital had any severer type of cases.

Furthermore, in hospitals of today, one treats complications in diabetes which are so serious that one would not have thought of treating them years ago. For instance, Dr. Arthur Chute has taken the prostate out of seven diabetic patients successfully. He has operated upon three for cancer of the bladder or prostate, and one patient had this done last year when possibly some of you may have been in Boston. Dr. Robert C. Cochrane recently had eight surgical diabetics at the Deaconess Hospital under treatment at one time. Formerly, I do not think that there were that number of cases coming for treatment of surgical affections. Now, as we know, one can perform practically any kind of operation upon a diabetic, but one must be very cautious about it. When it is necessary to operate, one should operate without ether or chloroform anesthesia, but with local anesthesia, or gas and oxygen, and everything should be done to prevent unnecessary trauma and to conserve the patient's strength. One likes to have a patient sugar- and acid-free, but if a man's leg, according to the opinion of the surgeon, should come off, I think it ought to come off that same day.

The point is not to try to get the patient sugar-free too suddenly. Under-nutrition at this juncture is useful, and if a patient only gets one-half or even one-third as much to eat as he ordinarily would, he will probably become sugar-free after the operation in the course of a few days or two or three weeks, even though sugar, and acid poisoning as well, should be present at the start.

Most of all, it is important for us all to consider that every doctor can help in the treatment of diabetes. Each can make an attempt to discover a case early and to treat the mild case energetically. If you treat one patient well, all profit thereby.

THE DUODENAL TUBE IN THE STUDY OF LIVER AND PANCREATIC PATHOLOGY*

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The time comes when every new diagnostic or therapeutic procedure is engulfed in a wave of enthusiasm. It is accepted by many, probably by a majority, and is used to the exclusion of all other time-honored methods.

After many honest, although prejudiced and undependable reports find their way into the literature, a certain percentage of physicians, some of a scientific and others of an inquisitive nature, approach the subject with open minds, work out scientifically the problems that are presented, and finally the procedure takes its place among other medical solutions, or is discarded as worthless.

The question of gall bladder, liver and pancreatic pathology and function seems to us to have reached that stage of enthusiasm and faddism, and it now becomes necessary to determine as nearly as possible just what position it must occupy among the other diagnostic and therapeutic procedures, relative to these organs whose value, time, chiefly, has established.

A rather comprehensive review of the literature for the past two years leaves one with the feeling that "Here is something really worth while; its value is proven and we must make use of it." On the other hand we have personally inquired of several well known clinicians and written to others and while few have expressed themselves as having no confidence in the diagnostic value of these procedures, most of them have said that more work and more time was necessary to prove their worth. Fairly representative is the following from a letter recently received from a well known internist:

"We have used the Lyons method for the bacteriology of the bile and have obtained little results from it. I feel that the method has certain

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advantages which should be worked out by careful critical persons who are not misled by their enthusiasm."

We desire to have it understood therefore that we occupy the middle position, neither as special pleaders, intent only on establishing the worth of these several methods, nor as skeptics seeking to discredit them. We furthermore desire to have our data looked upon merely as a preliminary report, since the number of cases studied is not large. We believe that more will be accomplished by an intensive study of the individual case than by the indiscriminate reporting of large numbers of simple drainages. While the simple procedure of drainage has been carried out more than 300 times the data here presented is based on a rather intensive study of 100 individuals, in whom various other diagnostic methods have also been applied. In the study of these 100 individuals we have asked ourselves a number of incisive questions and attempted to find the answers in a tabulated series of results. Among these questions have been:

(1.) Do the various diagnostic procedures check favorably with careful histories and examinations?

(2.) Does the microscopic, macroscopic and cultural study of the biliary contents offer a clue to liver and pancreatic pathology, or may the same findings be encountered in healthy individuals, or in other conditions where the liver is probably spared?

(3.) Is there any reliable method by which liver function may be tested?

(4.) What is the value of other signs and symptoms, usually employed in the study of these conditions?

We do not feel that our findings answer many, if indeed any of these questions conclusively. We present the data accumulated, to be taken at its face value and to throw its small weight in whichever direction it may. We quite appreciate the fact that the final valuation of these methods both therapeutically and diagnostically must be based on a wider experience; but, we believe, along much the same lines. Our investigations in addition to the usual careful history and examination have embraced the following procedures:

(1.) A careful study of the biliary secretion microscopically, macroscopically and culturally with very strict adherence to the methods outlined by Lyons.

(2.) An estimation of the pancreatic ferments, amylase, protease and lipase in the duodenal contents.

(3.) The function of the liver through: (a) A colorimetric study of phenoltetrachlorphthalein, recovered in the bile obtained by means of the duodenal tube. (b) The hemoclastic crisis of Widal and co-workers. (c) Urobilin in the urine.

(4.) Gastric analysis, fecal analysis, urinanalysis and fluoroscopic and radiographic study of the gastro-intestinal tract, as well as routine Wassermanns.

(5.) In many cases special investigations including blood chemistry methods and basal metabolism.

The theory and technic of the Meltzer-Lyons method of duodenal drainage has been described so often that a repetition is scarcely necessary.

In chart No. 1 we have attempted to show graphically a comparison of our findings in cases clinically gall bladder disease, with cases of other known pathology. It will be noted that of 44 cases which were clinically gall bladder disease 54% were positive as to the macroscopic appearance of the bile recovered, 59% were positive microscopically, and 41% positive culturally. It is interesting to note the percentage of positives in other cases, particularly those of osteo-arthritis. While the number is extremely small and we realize that before any definite conclusion can be obtained, more work is necessary, the fact, however, that in 80% of these cases the bile was positive macroscopically, was positive microscopically 100%, and practically the same percentage were positive culturally as found in clinical gall bladder cases, gives food for thought, particularly since in these five cases no other foci of infection were demonstrable.

The blood chemistry was negative as far as uric acid was concerned, and all were improved by therapeutic use of the tube. The question naturally arises whether foci of infection may not frequently exist in the gall bladder in such cases. The same might be said of cardio-renal disease in which there is a fairly large number of positive findings. The twelve miscellaneous cases show practically the same

figures macroscopically and microscopically as those found in the clinical gall bladder cases, and the question again arises whether these findings necessarily indicate pathology of the biliary tract itself. Certainly in view of the fact that the findings are so similar in the various conditions, doubt arises as to their significance from a diagnostic standpoint. We have considered macroscopically abnormal those biles that have increased viscosity, increased specific gravity, and turbidity. We do not believe it has been definitely proven that any of these conditions necessarily indicate pathology, although usually found where definite pathology can be demonstrated. For microscopical abnormality we have considered the presence of many crystals, red and white blood cells, and bile stained epithelia. We believe that any considerable quantity of pus is distinctly abnormal, but we are not yet satisfied that many crystals or even bile stained epithelia, unless in large quantities and of a particular type, are necessarily abnormal. At this point we refer particularly to numerous reports of pus cells being found in the various bile fractions. In our experience this has been extremely rare, and never found in cases that were not easily diagnosed clinically as gall bladder disease. We have found fairly constant a cell varying from the size of a small lymphocyte to a large epithelial cell with a single nucleus in the smaller cells, to four or five nuclei in the larger cells which with Wright's stain take a rather deep blue for the nuclei and a paler blue for the protoplasm. These are not the large irregular polyhedral cells which are recovered from the liver, nor are they to be associated with the columnar epithelia that come from the smaller bile ducts that are strengthened by fibrous connective tissue. We have felt that in all probability this character of cell came from the duodenum.

There is still another cell that has caused us much annoyance and which for a considerable time was thought to be leucocyte. It is about the size of a polynuclear leucocyte, does not vary in size, and in many respects resembles the nuclei of larger cells found in the same specimen. These cells, however, have been watched for a period of twelve hours under the microscope and no degeneration of the protoplasm, leaving the nuclei free, has been demonstrated. It has occurred to us that this difficulty has been encountered by other investigators and we have naturally wondered whether or not many of the reports of pus cells found in the bile were not really these peculiar cells, which by various staining methods, are epithelial. Whether or not this is true, the fact remains that we have not been able to demonstrate pus with anything like the frequency of other observers.

Our bacteriological studies have been carried out under the strictest precautions. The free end of the tube has been thoroughly sterilized and the bile from the different fractions has been allowed to drop immediately into the culture media, which are then immediately placed in the incubator. Several media were used in the beginning of our work, but since invariably the growths appeared on blood agar plates or glucose bouillon, all other media were discarded and the material from the duodenum and the three biliary fractions was planted on these two media and left in the incubator for 48 hours. It is possible that

PANCREATIC FUNCTION TESTS MADE IN 53 CASES: RESULTS

	Good	Per Cent	Moderate	Per Cent	Poor	Per Cent	None	Per Cent
Protease . .	39	74	8	15	3	6	3	6
Amylase . .	13	27	11	22	17	34	13	27

LIPASE TEST MADE IN 34 CASES

	Over 5	Per Cent	Less Than 5	Per Cent	None	Per Cent	Paradoxical	Per Cent
Lipase . . .	8	22	18	55	4	11	4	11

Paradoxical results being those in which control showed greater digestion than active specimen.

X-RAY EXAMINATION OF G. I. T. AND GALL BLADDER MADE IN 55 CASES: RESULTS

Negative throughout	36	65%
15% to 25% 4½ hr. residue	8	17%
Gall - stones	2	4%
Marked ptosis	3	6%
Adhesions, duodenum to gall tract	4	8%
Persistent cap deformity	3	6%
Enlarged gall-bladder	1	2%
Diverticulosis — colon	1	2%

a very small percentage of growths might be obtained on other media by leaving in for a longer period of time.

We are far from being convinced as to the value of positive cultures. It would seem fair to assume that in those cases returning negative cultures from the duodenum itself and positive cultures from the B or C fractions, possibly some significance could be attached. In those cases, however, in which positive cultures are obtained from the duodenum much doubt must attend where a growth is obtained from material which must pass over this infected area. The question then arises whether such organisms as the colon bacillus may not frequently exist in the upper alimentary tract without producing any actual pathology. While the duodenum normally is supposed to be sterile we believe there are many conditions in which it is not sterile. We have on several occasions obtained positive cultural results from the duodenum before sterilization with silver solution, and in the material obtained shortly after, our results were negative. Whether or not we were able to sterilize this portion of the tract must remain questionable.

The quantity of bile recovered, its viscosity and specific gravity are points that we feel must still remain in doubt since there are so many factors, such as the rate of blood flow through the liver, that regulate these things. If Meltzer's law is correct (and while this seems to have been proven there are many who still question it), it would seem that many things, particularly with reference to digestion in the stomach, would influence it. If the law of contrary innervation is true, then it is a physiological affair and must be under control of stimuli produced by the acid chyme leaving the stomach. This variable factor of digestion dependent upon various food stuffs would appear to us to influence to a marked degree the functioning of this law. The normal stomach is known to vary to a very large extent in the degree of acidity, and even under normal conditions there are times when there is probably no free acid. We would assume under such conditions that there is not the relaxation of Oddi's muscle nor the contraction of the gall bladder that would be found under the opposite conditions. Therefore, any change of viscosity or specific gravity we feel may be due, temporarily at least, to many physiological phenomena, or at least phenomena not indicating pathology.

CHART No. 1—DETAILED FINDINGS IN DIFFERENT CLASSES OF CASES STUDIED

Clinical Diagnosis	Macroscopic			Microscopic			Culture			Gastric Analysis					Amylase			Pancreatic Ferments: Protease			Pancreatic Ferments: Lipase		
	No.	Pos.	Per Ct.	No.	Pos.	Per Ct.	No.	Pos.	Per Ct.	No.	−20	Per Ct.	+40	Per Ct.	No.	Neg.	Per Ct.	No.	Neg.	Per Ct.	No.	Neg.	Per Ct.
Gall-bladder	44	24	54.5	44	26	59	44	18	41	13	12	37.5	7	21.8	27	7	25	27	1	4	13	2	14
Cardio-renal-vascular	10	1	10	10	4	40	10	3	30						8	2	25	8	0	0	6	2	33
Osteo-arthritis	5	4	80	5	5	100	5	2	40						3	1	33	3	0	0	3	1	33
Duodenal ulcer	4	2	50	4	2	50	4	1	25	2	0	0	2	50	2	0	0	2	0	0	2	0	0
Endocrine 1																							
Epilepsy 1																							
Hyperthyroid 1	12	6	50	12	6	50	12	2	16.7	5	5	41.5	2	16.6	12	2	16	12	1	8	12	3	25
Enteroptosis 3																							
Neuro-syphilis 3																							
Pulmonary T. B. 2																							
Anemia (second) 1																							

PANCREATIC FERMENTS

Since the return from the duodenal tube was bound to contain a certain admixture of pancreatic juice an effort to determine the activity of the pancreatic ferments in the cases studied naturally suggested itself. The method followed was substantially that outlined by Whipple and recently reported in the *Annals of Surgery*. In 27 cases which were clinically gall bladder or liver disease, 25% showed an entire absence of amylase, 4% an entire absence of protease, and 14% an entire absence of lipase. The remainder, and as will be seen by the chart the greater majority of this group, show the presence of all three ferments in varying degrees. In 25 cases in which there was nothing to suggest any gall bladder or liver impairment whatever, five showed an absence of amylase, one showed absence of protease, and six

showed absence of lipase. These results vary so widely and with so little regard for any demonstrable underlying pathology that we have felt that the method as herein outlined was practically without value. It is quite impossible in connection with the gall bladder drainage procedure as here outlined to administer the various pancreatic meals which have been recommended and which promise far greater and more reliable information as to pancreatic function. Our conclusion

CHART No. 2—PHENOLTETRACHLORPHTHALEIN TEST IN 22 CASES

Case	Phenoltetrachlorphthalein Return	Max.	% 2 Hrs.	Feces	Urine	Bile Macro.	Micro.	Culture	Diagnosis
A	7	25	47.0	0	0	0	0	0	Normal
B	35	Trace	Trace	0		0	0	Strep.	Osteo-arthritis
C	17	29	40 00			0	0	Unknown	Cholecystitis
D	11	39	70.0			0	0	0	Cholecystitis
E	89	Trace	Trace			0	0	Colon	Cholecystitis
F	15	45	10.8			+	+	Colon	Osteo-arthritis
G	37	40	9.2			+	0	B. Pyoc.	Cholecystitis
H	39	Trace	Trace			+	+	Colon	Hypertension
I	31		5.7			+	+	Colon	Hypertension
J	30	40	8.3			+	+	0	Neuro-syphilis
K	20	90	10.3			0	0	0	Secondary anemia
L	15	90	33.3			0	+	0	Cholecystitis
M	19	90	38.4			+	+	Colon	Cholecystitis
N	47		7.2		0	0	0	0	Pernicious anemia
O	60		4.8			0	+	Colon	Hypertension
P	30		7.6	0	0	+	0	0	Normal
Q	24		6.5	0	0	0	0	0	Hypertension
R	47	90	20.0		+	+	+	0	Tachycardia
S	90		6.5		0	+	+	0	Hypertension
T	20	90	12.5		+	+	+	0	Normal
U	0		0	*	0	0	0	0	Chronic appendicitis
V	0		0	0	0	0	0	0	Normal
W	0		0	0	0	0	0	0	Normal

Note that in two of the normals there was no appearance of the drug whatever either in bile, stool or urine; also, that in several definite cholecystitis cases there was a comparatively high percentage returned with a short appearance time.

then is that where the pancreas comes under considerable suspicion, an independent effort, aside from the gall bladder drainage procedure, should be made by the use of pancreatic meals to determine more accurately the activity of the pancreatic ferments.

HEPATIC FUNCTION

Efforts to arrive at a satisfactory clinical method of establishing the function of the liver date back almost to the time of the discovery by Claude Bernard of the glycogenetic function of that organ. The considerable number of tests which have been evolved in the intervening years may be classified broadly in accordance with that phase of liver function which they have attempted to estimate. The liver activities may be defined primarily as the exocrinous or combined secretory and excretory functions, and the group of endocrinous functions under which are comprised ureagenesis, glycogenesis, sanguinopoiesis, the fixation of toxins, cytopexis, and the lipasic function.

Earlier attempts concerned themselves largely with the estimation of sugar tolerance as evidenced by the appearance or non-appearance in the urine of glucose after the ingestion of measured amounts of various sugars. These were all found so unreliable, owing to the numerous factors other than hepatic function which were capable of influencing them, that they have only historical interest. Attempts to utilize the ureagenetic function of the liver as an index to liver capacity were made by estimating nitrogenous products in the blood, and more particularly in the urine. The

fact that the results obtained in these estimations were so largely dependent upon the integrity of the kidney, has invalidated them as tests of liver function and relegated them to another field. Several tests based on an effort to determine the antitoxic power of the liver cells have been taken up and subsequently, for the most part, discarded. Of these may be mentioned the Chauffard methylene blue test which was dependent upon supposed variations in the urinary excretion of subcutaneous injections of methylene blue solutions in cases of impaired hepatic efficiency; Roche's modification of this procedure; indicanuria both spontaneous and that provoked by the ingestion of indol; and the provocative sulphoconjugation test of Foster and Kahn. The intimate connection of the liver with the elaboration of certain constituents of the blood, particularly fibrinogen, has led to a number of tests to estimate the sanguinopoietic function of the liver cells. Of these the estimation of blood coagulation time with the assumption that decreased coagulation time indicated impaired hepatic function, the fibrinolysis tests of Goodpasture; Whipple's estimation of blood lipase, and the estimation of proteolytic ferments by the Abderhalden method should be mentioned. These tests all concern themselves with the endocrinous functions of the liver.

CHART NO. 3—CONTRASTING THE HEMOCLASTIC CRISIS TEST IN 7 CASES OF GALL BLADDER DISEASE WITH 10 CASES WITH NO GALL-BLADDER PATHOLOGY

Diagnosis	Hemoclasis					Duodenal Drainage		
	Start	15 Min.	30 Min.	45 Min.	60 Min.	Macro.	Micro.	Cultures
Hypertension	9800	9600	6000	7400	10000	+	+	Colon
Anemia—Ca. ?	8000	6500	6400	5000	5500	0	0	0
Hypertension	7800	9000	9400	12000	7600	0	+	0
G. B. adhesions—P. O.	6900	7100	7200	8300	6800	+	+	Colon
Gastric ulcer	6600	6800	6600	6400	7400	+	+	0
Cholecystitis	9200	7800	7000	7600	8500	+	0	?
Normal	12000	12100	13000	12900	13100	0	0	0
Normal	10300	10500	11000	10400	10000	0	0	0
Arthritis	11300	11200	10800	11000	10000	+	+	0
Hypertension	8300	8800	9000	8500	8000	+	+	Colon
Cholecystitis	7500	10300	10000	10600	8000		+	0
Normal	9000	10100	10000	9400	9300	+	+	0
Cholecystitis	6800	8000	7000	7400	6800	+	+	0
Cholecystitis	9200	8600	8900	8600	8400	+	+	
Cholecystitis	14300	15600	15700	15500	15000	+	+	
Cholecystitis	6800	8000	7700	7400	6800	+	+	
Neuro-syphilis	12000	16600	8600	12300	12200	+	+	0
Average 7 G. B.	8670	9200	9350	9340	8750			
Average 7 other	9100	9050	8420	9210	9100			

Of more current interest are the attempts to estimate the biliary functions of the liver, most prominent among which are the urobilinogen and urobilin tests, and the phenoltetrachlorphthalein method. The only bile pigment present in fresh liver bile is bilirubin. It is only with the oxidation of bilirubin in the gall bladder or in the intestines that biliverdin, the darker pigment, is formed, it being the oxidation product of the former. The bilirubin is of course formed in the liver from the disintegrated hemoglobin of the red blood cells which is carried to and fixed by the liver, where it is converted into the iron-free pigment bilirubin. Under normal conditions bilirubin does not appear in the feces but there does appear there the related product urobilin, which is the reduction product formed in the intestines by the action of the hydrogen on bilirubin. A portion of the urobilin thus formed escapes in the stools. Another portion undergoes reabsorption in the form of urobilinogen which again is partly eliminated in the stool, while the remainder returns to the liver and is reconverted into bilirubin.

It is with the last step in this process that the bilirubin test for hepatic function concerns itself, since it is assumed that in the presence of marked impairment of the liver cells the final fixation and reconversion of the urobilinogen will not occur, thus permitting the excretion

of that substance in the urine where it very shortly spontaneously changes into urobilin by oxidation. The two substances, so far as urinary determinations are concerned, may then be regarded as practically identical, being the same substance in different forms.

Urobilinuria may be caused by a large variety of conditions, among them malaria, pneumonia, lead poisoning, decompensated heart disease, severe anemias, and hemorrhage, in addition to liver conditions. The mechanism of its occurrence in connection with hepatic conditions may be either partial or incomplete interference with the biliary flow in the ducts, or insufficiency of the liver cells themselves. Obviously, in complete obstruction of the ducts no bile would be thrown into the intestines and hence no urobilin formed. Urobilinuria may therefore be either relative or absolute; relative in cases in which the greatly increased destruction of red blood cells overwhelms the normal capacity of the liver to care for the liberated pigment; and absolute when the liver parenchyma is unable to fix and reconvert normal amounts of urobilin. It is only in the latter case that urobilinuria becomes an index to hepatic function. In hepatic disorders which are ultimately characterized by jaundice there is ordinarily a period of urobilinuria preceding the icterus. The well known Ehrlich's urobilinogen test based on the benzaldehyde reaction was the most widely used of these tests and had a considerable vogue. In recent years it has fallen into disrepute owing to the large list of conditions other than primary hepatic impairment which give positive findings. However, a test for urobilinuria, the results of which shall not be deemed in any way definite and which shall be considered in conjunction with and in relation to a number of methods calculated to throw light on the status of hepatic function, no doubt has a place, in view of its simplicitiy and its confirmatory value.

CHART No. 4—TABULATED FINDINGS IN 10 CASES OF POSITIVE CULTURAL FINDINGS

			Culture			Micro.	Macro.	Pancreatic Ferments				Gastric		Tetrachlorphthalein	
Case	Age	Amount B. Bile	"A"	"B"	"C"			Amylase	Protease	Lipase	History Typhoid	Free Acid	Total Acid	Return	Total 2 Hrs.
A	47	100		Pure		Neg.	Nor.	+	0		No				
B	53	140	P	P	P	Neg.	Nor.	+	0		Yes	39	73	0	0
C	50	40	P	P	P	Mucus	Floc.	+	0		No			31	5.7
D	43	158	P	O	P	Neg.	Stat.	+	0	.3	Yes	66	90		
E	45	82	P	P	P	W.B.C. Mucin	Stat. Floc.	+	+	6.6	Yes	0	20		
F	46	0	P	O	P	W.B.C.R.B.C.	Floc.	0	+	3.3	Yes	80	106	19	38.4
G	57	60	P	P	P	Mucin	Floc.	+	+	0	No			18	108%
H	40	50	P	P	P	W.B.C.	Floc.	0	+	5.4	Yes			39	?
I	75	130	P	P	P	Mucin Crys.	Stat. Floc.	0	+	.3	No	0	0	68	?
J	46	150	P	B. Coli and Staph.		Mucin	Nor.	+	+	.2	No	6	24		

Note.—"P" indicates that a pure culture of some organism was obtained from the particular biliary fraction designated.

THE PHENOLTETRACHLORPHTHALEIN TEST

In an effort to find a dye which would provide a test of liver function similar to the 'phthalein test for kidney function, Abell and Rountree, in 1909 began a pharmacological study of phenoltetrachlorphthalein. A considerable amount of experimental work established the fact that under normal circumstances in normal individuals a suitable quantity of this drug injected intravenously escaped from the body exclusively in the bile. While some reabsorption by the bowel was found to occur, it was thought that this could be very largely prevented by hurrying the progress of the fecal stream with purgatives. Work on dogs done by Whipple, Mason, Peightel, and Clark further established the fact that in dogs in which experimental injury had been done to the liver parenchyma the rate of excretion of

the dye was retarded in direct relation to the damage done to the liver cells.

A clinical application of the test was first worked out by Rountree, Horwitz, and Bloomfield, and the method consisted of the injection intravenously of 400 mg. of the drug, which procedure was followed by free purgation and collection of the stool for 48 hours and the urine for 24 hours. The quantity of the dye excreted in the stool was then determined by colorimetric methods after separating the pigmented substances in the stool from the dye solution so far as possible by precipitation and dilution. The fact that this procedure never gained the popularity of the 'phthalein kidney test was no doubt largely due to the increased technical difficulties contingent upon the collection and manipulation of the 48 hour stool specimen, but also to some extent to the fact that even where the original technic was carefully and thoroughly carried out the results were by no means as uniform as in the kidney tests.

The increased ease of application and shortening of the time required for performance of the test, together with the assumption that lack of uniformity of results in the old method might be due in part at least to reabsorption of the drug by the bowel, led several investigators at about the same time to employ it in connection with gall bladder drainage. Our technic was worked out independently, considerable difficulty being experienced in procuring suitable specimens of the drug. Its manufacture commercially had apparently been discontinued. The method used consisted in the intravenous injection of 1 c. c. of a solution containing 50 mg. of the disodium salt of the drug. This injection was made at the phase of the gall bladder drainage when all the "B" or gall bladder bile had apparently come away and the flow had settled down to a steady even homogeneous stream of "C" or liver bile. The drainage was received into flasks containing a small amount of sodium hydrate solution changed frequently enough to make the first showing of color accurately perceptible. The observations in connection with the excretion of the dye consisted in noting: first, the appearance time; second, the approximate time of maximum concentration as indicated roughly by the depth of color in the flask; and third, the total recovery in two hours following the injection, which last figure was obtained by colorimetric methods. The preparation used in the first group of tests was obtained through courtesy from another investigator who had had it prepared under his own direction. With this preparation great difficulty was experienced in the final colorimetric reading owing to the fact that the tetrachlorphthalein color was faint and varied widely in character from the standard. A method was finally evolved which depended upon the admixture of the same proportion of clear "C" bile to the standard that was present in the unknown. It then became possible to read the color apparently quite accurately. With this preparation the appearance time was in some instances as early as 7 minutes and the total return as high as 70%.

As the available supply of this preparation was limited we proceeded to have a larger supply made up according to the original method outlined by Rountree, except that in the preparation of the disodium salt a slight excess of alkali was used

CHART No. 5—GENERAL TABULATION OF FINDINGS IN 100 CASES

Diagnosis	No.	Culture		Macro.		Micro.		X-Ray		Typh'd Hist.		Curve	
		+	—	+	—	+	—	+	—	+	—	+	—
G. B. Disease	48	17	31	24	24	29	19	16	32	13	35	41	7
Cardio-renal-vascular	16	3	13	1	15	4	12	0	6	3	13	15	1
Osteo-arthritis	5	2	3	4	1	5	0	0	5	1	4	5	0
Duodenal ulcer	4	1	3	2	2	2	2	4	0	0	4	4	0
Vague gastro-intestinalis	15	2	13	3	12	2	13	0	5	1	14	15	0
Miscellaneous	12	2	10	6	6	6	6	0	0	2	10	11	1
Totals	100	27	73	40	60	48	52	20	48	20	80	91	9
		+	%	+	%	+	%	+	%	+	%	+	%
G. B. disease	48	17	35	24	50	29	60	16	35	13	27	41	83
Other	52	10	20	16	31	19	35	4	8	7	13	50	95

to prevent precipitation during sterilization of the ampoules. Our later tests were made with this preparation and the results we obtained varied quite widely from those obtained with the first preparation. Although the quantity used was the same, the red color was more marked in the returned fluid and was apparently very much less altered in its passage through the body as it could be easily read against the standard without any previous addition of bile to the standard. The earliest return of color with experimental subjects of apparently normal liver function was 15 minutes, and the largest total return 38% as contrasted with 70% in the first series. Our first test was done on a perfectly normal subject. The drug appeared in 7 minutes with the maximum return in 25 minutes, and a total of 47% in two hours, and the total disappearance of the drug from the bile in three hours. The feces were saved for 48 hours and no trace of the drug could be found here nor in the urine.

With this single experiment we were very hopeful that the test would prove of great value in determining liver function since it seemed that it would be possible to establish a normal appearance time and a normal two-hour return if all of the drug was recovered in the bile, and the feces did not have to be considered. We attempted to explain the absence of the dye in the feces on some physical basis, believing that possibly through syphonage the entire amount of bile was diverted to the tube. The problem, with diagrams, was presented to a physicist who explained that this could not be a constant finding and there was no physicial basis to make it even probable.

With further work we were, however, doomed to disappointment since frequently small quantities were found in the feces, occasionally small amounts in the urine, and the time of return and the quantity recovered in two hours was so variable and so entirely out of keeping with what was to be expected that we, at this writing have serious doubts as to its value from a diagnostic standpoint. Five cases in which there was no ground in the final analysis for a suspicion of any hepatic impairment gave a total return in the two hour interval of less than 10% of the drug, and in one instance less than 5%. Two perfectly normal individuals that were used merely for experimental purposes showed absolutely no trace of the drug in two hours time although there was a steady return of bile. In four cases of hypertension with a moderate amount of kidney involvement the appearance time of the drug varied from 30 minutes to 60 minutes, and the total two-hour quantity was less than 10%. On the other hand two cases of quite typical cholecystitis gave appearance times of 15 minutes and 19 minutes respectively with a total return of 33% and 38%. Our largest total return of 70% was obtained in a patient with quite definite history of gall tract trouble whose symptoms were being markedly relieved by repeated therapeutic drainages. In other words, so far as our small series of cases enable us to draw any conclusions in regard to the value of the phenoltetrachlorphthalein test as used in connection with the gall bladder drainage there seems to be no uniformity of relationship between either the appearance time or the total return, and the clinical diagnosis, x-ray, cultural, or physical findings. Furthermore we are unable to see how the obvious sources of error such as the destruction of the dye by the liver itself, the amount of reabsorption from the intestines, and the amount excreted by the kidney can be corrected.

HEMOCLASIS

The digestive hemolysis test for insufficiency of the liver was originated by Widal, Abrami and Iancovisco and presented in the Presse Medicale in the early part of the present year. The value of the test was based upon their claims that some of the proteins in the food which escaped disintegration pass through the wall of the intestines and penetrate into the portal vein. The liver holds back some of these disintegrated proteins when the blood passes through it. They call this the proteopexic function of the liver. When the liver is incapable of thus retaining these incompletely disintegrated proteins they pass into the general circulation where they exert a destructive action on the blood corpuscles, the digestive hemoclastic crisis, as they call it.

They did not find this in a large number of healthy persons examined, nor in other than liver conditions. In various forms of liver disease, however, this hemoclastic crisis was pronounced, the leucocytes dropping to one-half or one-third of the predigestive figure. The test consists simply of counting the leucocytes before and at intervals for an hour after taking a glass of milk on the fasting stomach. They claim that in normal subjects the leucocyte count is about the same, but with derangement of liver function there is a pronounced destruction of leucocytes during the first hour or two of digestion. Working on this principal a comparatively small number of cases were studied without in the slightest degree having our figures agree with the work done by these investigators. The chart is a tabulation of 17 cases, seven of which were clinically liver or gall bladder disease and ten other pathology. On the same chart will be noted the macroscopical, microscopical and cultural study of the bile obtained by the Lyon method. It will be seen that the average counts in the seven gall bladder cases and the ten remaining cases is practically identical, neither showing any reduction in the number of leucocytes. As a matter of fact, in the one case showing more than the others this so-called hemoclastic crisis, the bile was perfectly normal in every respect. In only one case of cholecystitis was this reduction in leucocytes noted, and then to a moderate degree only. From our own experience, therefore, we are quite convinced that the determination of the hemoclastic crisis has little or no place in the diagnosis of liver pathology unless it may indicate damage done to the liver by arsphenanim treatment or chloroform. Indeed it seems that a large number of patients investigated by these workers were under some form of arsenic treatment and it is quite possible that this may account for their results.

THE INDUCED GLYCURONURIA TEST

This test was proposed by Chiray and Caille who make rather extravagant claims for it. We have had no experience and simply mention it as a test for liver function that is being given some attention. It consists of taking two capsules each containing .5 grams of natural camphor on the fasting stomach. The urine is collected at once and again six hours later. The liver function is estimated through determining the glycuronic acid in the urine by lead colorimetric method. In the normal individual glycuronuria follows, the figure running from .01 or .04 up to .08 grams in four hours, and it remains high for six or eight hours. The test is merely given for what interest it may arouse.

X-RAY STUDIES

Considerably over half of the cases reported have had a complete x-ray examination of the gastro-intestinal tract including films of the gall bladder region. Of 55 cases studied up to the present time 36, or 65%, were negative throughout, and 8 or 17% show as their only x-ray abnormality a 4½ hour barium residue in the stomach varying from 15 to 25 %. In four cases there was evidence through misplacement or deformity of the duodenum of adhesions involving the duodenum and the gall bladder. In three cases there was only marked general enteroptosis. In three cases there was a characteristic duodenal cap deformity persisting at repeated examinations, of the sort accepted as characteristic of ulcer. In one case an enlarged dense gall bladder was demonstrated on the x-ray films. In one case there was a diverticulum of the transverse colon and in two cases definite shadow evidence of gall-stones.

Of the cases showing a 4½ hour barium residue, five were clinically gall bladder disease, the remaining three having no symptoms pointing toward the gall tract. The two cases showing gall stones were clinically characteristic of cholecystitis, although neither had had colic. None of the enteroptotic cases had any evidence of associated gall bladder disturbance. The cases showing duodenal cap deformity were typically duodenal ulcer both as to history and clinical findings, no evidence pointing to associated gall bladder disturbance. We found it necessary in only a very few instances to verify the position of the tip of the Lyons tube in the duodenum fluoroscopically. In these instances where it had been impossible to

obtain a satisfactory alkaline bile stained return from the tube the tip was found to be invariably outside the duodenum. The results are noted in chart No. 5.

OTHER INVESTIGATIONS

History of Typhoid.—It is rather interesting to note that 27% of the cases that were clinically gall bladder disease gave a history of typhoid fever. This would seem to be of some significance when compared with 13% of all other cases that gave a typhoid history.

Blood Counts.—A complete count of the red and white blood cells as well as a differentiation of the latter was done routinely, but the results were not sufficiently instructive or interesting even to present here.

Gastric Analysis.—If the theory of Meltzer's law is correct it would appear that in all probability any condition which would bring about an anacidity of the gastric contents would in turn interfere with the normal functioning of the phenomena of gall bladder contraction and sphincter relaxation and thus bring about stasis and eventually infection and possibly gall stone formation. Therefore, it would seem that in a majority of cases at least where cholecystitis or gall bladder disease was present we could expect subnormal figures at least for gastric acidities. It will be noted in chart No. 1 that in 37.5% of the cases with clinical findings positive free acid was under 20, and that in only 21.8% were the acidities above 40. The theory of the functioning of the law of contrary innervation is probably correct. Where hyperacidities exist in connection with gall bladder disease, in all probability the disease was primary and the hyperacidity was a reflex affair much as we get in disease of the appendix or other portions of the alimentary tract. When we pass on down the chart and find that of the 12 miscellaneous cases in which the gall bladder was not even suspected 41.5% had free acids below 20 and only 16% free acids above 40, the question naturally arises, just how far can we apply such findings to the biliary tract.

Some rather interesting points have developed in connection with our gastric analysis that would suggest the advisability of the fractional method of analysis in most cases. We have in several cases obtained markedly subnormal figures after the usual Ewald test meal and the following day when the gastric residuum was removed before starting the usual drainage we found extremely high figures for free acid. The reverse of this has even more frequently been demonstrated.

We should like to call atention to the chart showing ten cases in which pure cultures were obtained from the biliary tract and the comparison of the other findings in the same individual. This does not represent the total number of positive cultures and is produced merely to show the comparison between this and other findings. For instance in case A with pure cultures of B coli from "A", "B", and "C" fractions the bile was negative macroscopically and microscopically. The same was true of case B in which there was practically a normal gastric analysis, but a total absence of phenoltetrachlorphthalein in two hours. Case F, a post-operative case with dense adhesions surrounding the gall bladder, upon a recurrence of symptoms, showed a pure culture in the "A" and "C" fractions (no "B" bile being obtained) with positive microscopical and macroscopical findings, an intense gastric hyperacidity, with a total tetrachlorphthalein output of 38.4%, a wholly inconsistent finding. The high acidity is in keeping with the theory that the gall bladder infection was primary and not dependent upon previous disturbance of the gastric secretion. Pure cultures of the colon bacillus have been recovered in a far greater percentage than other organisms. In only one instance have we obtained a pure culture of typhoid, and quite strange to relate, no history of typhoid infection could be obtained. One pure culture of bacillus pyocyaneous was obtained at three different drainages. Various streptococci were of less frequent occurrence than colon bacilli.

What then are we to conclude from a study of our figures obtained in this rather small series? Frankly, we do not know. It is our intention to carry the work still further hoping to arrive in time at some conclusion that will be of real value. Un-

til that time the questions that present themselves are as follows: shall we let negative results from our various laboratory methods of studying the biliary contents influence our judgment where a careful and painstaking history and examination indicate the presence of liver or gall bladder disease? On the other hand, shall we be influenced by positive macroscopic, microscopic, or cultural findings of the biliary contents where from history and examination we are unable to find evidence of such pathology? We still have unbounded faith in the results obtained from a properly recorded history and a thorough and painstaking physical examination. We feel furthermore that any laboratory procedure to be of greatest value must corroborate to some extent at least the impressions obtained from these time-honored methods. This is true of practically every laboratory procedure that has been accepted in the medical practice of today.

The various methods herein outlined give great promise for the future. Much time and much hard scientific work, however, will be necessary before their value can be established. We shall continue to hope to see more light in the future, but at the present time when such procedures do not conform to a greater extent with impressions obtained from the two leading diagnostic methods, viz., a careful anamnesis and a thorough physical examination, their diagnostic value must be more or less questioned.

TECHNIC OF DIAGNOSTIC GALL BLADDER DRAINAGE AS USED IN THE CASES HEREIN REPORTED

The patient presents himself with fasting stomach at 9 a. m. The teeth are well brushed and the mouth cleansed with potassium permanganate and zinc chloride solution. A sterile Lyons tube is introduced into the stomach; residuum removed and preserved for analysis; stomach rinsed with sterile water until the return is perfectly clear. The stomach is then douched with diluted zinc chloride solution, followed by sterile water, 1-5000 silvol solution and again by sterile water. These solutions are warmed and as complete a return as possible is obtained before the succeeding solution is introduced. The patient then lies on the right side and takes twenty minutes to swallow the next 20 cm. of the tube. After the tube has entered the duodenum sufficient material for pancreatic ferment tests is first set aside and the duodenal cultures are taken. The duodenum is then douched with 100 c. c. of 1-5000 silvol solution, following the recovery of which 50 to 75 c. c. of 33 per cent magnesium sulphate solution is introduced. The "A" or duct, "B" or gall bladder, and "C" or liver biles are obtained in order. The amount of each, specific gravity, macroscopic and microscopic characteristics are recorded, and cultures made from each type of return by allowing the fluid to flow directly from the end of the alcohol cleansed tube into glucose bouillon, which is immediately placed in the incubator. A sterile centrifuge tube is also filled with each type of return, centrifuged and the sediment planted on blood agar immediately.

We wish at this point to express our gratitude for the careful and painstaking work of Miss Beatrice Fuge in supervising the laboratory aspects of this investigation.

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DISCUSSION

Dr. J. E. Paullin, Atlanta, Ga.—The paper of Drs. Dowden and Enfield brings to our attention very interesting observations which have particular reference to duodenal drainage as a diagnostic procedure. For some time we have made a study of the drainage obtained from the duodenum, both microscopically and bacteriologically as they have outlined. From the studies which we made in perhaps 100 cases or more we feel that the information obtained from this particular procedure, as being of great benefit in the diagnosis of gall bladder disease, was practically worthless. In other words, we obtained results which at times were so at variance with the clinical condition of the patient that as a diagnostic procedure it was practically valueless. It was virtually impossible to obtain cultures from the duodenal contents in normal individuals with sterile bile. As Dr. Dowden has well said, when a culture made from the washings of the duodenum showed a growth of either the colon bacillus, the staphylococcus, or some of the other organisms, we felt sure that cultures obtained from drainage with the bile would naturally show the same infection. In at least 15 cases we

attempted to check the bacteriology between the findings obtained from the duodenal drainage and the findings at operation; we were not able in the majority of instances to corroborate at operations the bacteriological findings obtained from duodenal drainage. In other words, in any gall bladder infections cultures made at the time of operation frequently did not show the organisms which we thought were obtained from the bile from the duodenal drainage, so this has caused us to lose confidence in the method as a diagnostic procedure.

As to the value of duodenal drainage in the relief of symptoms, that is entirely a different story and is not here for discussion.

Dr. J. Rowan Morrison, Louisville, Ky.—From my observations of the work of Dr. Dowden, checked up by the work of others, I can not say that we have very much of diagnostic value from duodenal drainage. I think it is very appropriate that men like Dr. Dowden should take up this subject and have it discussed from all angles to determine the value of this method of procedure. As the previous speaker has said, I am convinced that this method offers something as a method of treatment.

Dr. George M. Niles, Atlanta, Ga.—I have listened just as attentively as I could and with great interest to the paper of Dr. Dowden. I have endeavored to follow every word of it, and I realize that what he has read in a few minutes represents an immense amount of labor and thought, and still he says this work is preliminary. I think you will admit that as a result of his researches he strikes an uncertain note.

As to the diagnostic worth of this method it is very much *sub judice* as yet, but I believe on the whole the trend of his argument is somewhat against its value.

I received a letter from Dr. Lyon less than two weeks ago in which he stood for everything that he has heretofore claimed, and he does not "back water" in anything. Of course, we have to allow for enthusiasm, but Dr. Lyon is not a weak man by any means, and I feel sure he would not make a positive statement unless he felt reasonably certain of his ground.

I have had some clinical experience with this method. I have up to date made 614 of these duodenal taps on 141 cases. I have a certain amount of bacteriologic, microscopic and macroscopic data on hand which I am not ready to present as yet, and I am in a maze of uncertainty as far as these findings are concerned. I would be glad if Dr. Dowden would depart a little from the title of his paper and restrict the interpretation of his closing remarks so as to give us a few of his clinical results. We do not want in any way to get back to the old German trend of therapeutic nihilism where they used to say diagnosis was everything and therapeusis was nothing. I am anxious to get Dr. Dowden's viewpoint, if he will give it to us, as to the clinical potentialities of that which is at least worth while at present, and in the meantime I am sure he and other competent investigators will continue along these lines until they either come to a positive or a negative conclusion.

Dr. Dowden (closing).—The analysis of Dr. Niles' remarks would seem to indicate that we are in fair agreement concerning this procedure. He has spoken with particular reference to the method as a therapeutic procedure while my remarks have dealt with its diagnostic value. The point I want to make is simply this: that in many apparently normal cases as far as clinical symptoms were concerned we were able to demonstrate bacteriologically and microscopically similar findings to those obtained in other conditions that were clinically gall bladder or liver disease. I quite agree with Dr. Niles that where gall bladder disease or liver disease is diagnosed clinically that the procedure is warranted, and furthermore I believe will frequently give most satisfactory results. Certainly it is worth a trial and if satisfactory results are not obtained no harm has been done so far as we have been able to determine. As stated in my opening remarks, our results are presented for what they are worth and we are claiming nothing nor attempting to discredit anything. We shall continue with the work, but more in the future I am sure as a therapeutic aid than as a diagnostic procedure. It is possible that with further experience there will not be such a conflict between our laboratory findings and suggestions obtained from the history and careful physical examination. As long as this continues to occur, however, we feel that it is well to question such findings.

THE NEWLY-BORN SERVICE*

By L. R. DeBuys, M.D.,
New Orleans, La.

Of all the periods of life, that of the newly-born is probably the one which receives the least scientific attention, though it be the one scientifically most fruitful. This period is neglected because the infant is frequently overlooked in the interest shown the mother during the pueperium by her attendant who may be adept in the care of the mother but who has not devoted sufficient time, energy and study to the care of the newly-born. Were these newly-borns placed in charge of those whose life work is devoted to the early years and days of life it would be far better for all concerned. Because of the special study required of the normal newly-born infant and the diseases to which he is subject only those especially interested and trained in this period of life should be entrusted with his care. It is reasonable,

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therefore, if the practice of pediatrics includes the care of the individual from that period of life from birth to puberty, the newly-born should be included in this practice from birth, or at least from that period when he becomes an individual independent of his mother: namely, at the time the cord is tied and cut.

Thorough cooperation is essential to the welfare of both mother and child. For example, the pediatrist who is to supervise the feeding of the infant should study the source of the food supply (the breasts), and should cooperate with the obstetrician in advising the prospective mother how best to care for the nipples and breasts so that they will be in proper condition for the baby to nurse them. In this way many fissured nipples and abscessed breasts might be averted. To the pediatrist belongs the responsibility of the care of the breasts. The pediatrist who has not such control of the breasts that he can regulate properly the food for the baby is like the housekeeper who orders the food for the household by telephone. There is a certain amount of luck attached to the outcome in each instance. On the other hand the pediatrist should cooperate with the obstetrician, as for example, in considering the welfare of the mother in regard to whether nursing will be detrimental to the mother's health. Of course, the instances in which this difficulty arises are extremely rare.

Aside from the food supply, the question of bath, supervision of the feeding, habits, hygiene, etc., should be carefully considered. An improper start within the first few days may make the infancy a hardship to the mother, whereas, a proper beginning should allow the mother all the pleasures of parenthood with a minimum amount of hardship.

There are many babies improperly started, who are a constant drain on the mother's vitality because of the bad habits begun during the puerperium. The baby is turned over to the mother when the attendant leaves. She, owing to her diminished vitality and the ordeal through which she has just passed, is usually little able to combat them. Bad habits are easily formed but overcome with difficulty.

Aside from what has already been mentioned, the necessity for the early recognition of abnormal symptoms is more important at this period than at any other time of life, as a delay in the recognition of these symptoms is often the cause of a fatal termination. It is remarkable what good may often be accomplished and what spectacular results may be obtained from the close supervision of the newly-born.

At the Touro Infirmary in the charity service we have been successful in enlisting the cooperation of our progressive superintendent, Mr. A. B. Tipping, and the chief of the obstetrical division, Dr. J. W. Newman, and have established a service for the newly-born which has been operating very successfully. The service consists of an inside and an outside division. In the inside division the newly-borns come under the jurisdiction of my service immediately after the cord is tied. These babies are weighed and measured and physically examined. Daily observations are made upon each baby and in this way abnormal conditions are recognized in their inception. Temperature and weight curves are kept and notes made of the gastric and intestinal symptoms. The mother's breasts are closely supervised, as well as the nipples. Precautionary measures are taken to avert cracking of the nipples and caking of the breasts. Regular habits are immediately instituted so that the mothers may have properly trained babies when they leave the institution. Bad habits are prevented by having the babies fed at stated intervals, and at the same hours every day, and by their not being handled and spoiled.

The mother and baby are permitted to leave the hospital upon a discharge of both the obstetrical and the pediatric departments. Before discharge the baby undergoes a physical examination and a record is kept of the findings. Upon leaving the hospital, one of the field pediatricians in his turn is notified of the baby's leaving and his condition when discharged. The field pediatrician visits the newly-born on about the fifteenth day of life, satisfies himself of the good condition of the baby or, if any additional advise is needed gives it, and the mother is instructed to bring the baby to the newly-born clinic held in the out-patient department on the Thurs-

day morning nearest which the infant is four weeks old. These newly-born clinics are held every Thursday morning. Should any other advice be required between leaving the hospital, the visit at the home, and the visit at the newly-born clinic, the field pediatrician who is assigned to the case and follows it gives this advice.

It is needless to say that there is a special social service department for the obstetrical and newly-born services, conducted by a very efficient corps of nurses and workers who keep thoroughly posted as to every case, and of its record.

The outside division of the newly-born service is conducted as nearly as possible like the inside division. There are at the present time three field pediatricians who in rotation visit and assume charge of the cases as soon as they are born. They are notified when the baby is born, or if it is born at night, at 7:30 the following morning. In the meantime the case is given the routine care as determined by the Service. If an emergency exists they are immediately notified of the birth and the condition of the patient. The field pediatrician is responsible for the newly-born in the home and makes the necessary visits, after which he receives reports from the nurse or social service department as to the progress of the baby. After the puerperium the baby is again seen on the fifteenth day of life. These cases are also referred to the newly-born out-patient clinic when four weeks old. After the first visit to the newly-born out-patient clinic at four weeks the cases report as they are directed.

We have had very gratifying reports from the mothers of these newly-borns, many of whom have been unsuccessful in nursing previous babies. Irregular and bad habits of the babies have formerly prevented the mothers from having sufficient rest and consequently they have had less milk for the babies. It is also encouraging to see the number of healthy babies who are being developed under proper supervision.

Aside from these gratifying reports and encouraging observations, the newly-born service conducted in this way offers a very fertile field for the scientific study and investigation of the normal newly-born and the diseases to which he is subject, as well as the normal infant and those diseases associated with the growth and development during that period of life.

DISCUSSION

Dr. Hugh McCulloch, St. Louis, Mo.—It is very gratifying to hear Dr. DeBuys use the term "newly-born service" in place of post-natal service. It seems to me applying the term post-natal is almost putting the infant in the class of the placenta. The tendency in the past among obstetricians has been to regard the infant almost as a by-product, the particular care being given to the mother. To this Section an equally important function is the care of the newly-born.

Dr. Robert A. Strong, Pass Christian, Miss.—The mortality of our infants easily convinces us that there is one most important period of pediatrics that has not received the attention that it demands in spite of the fact that it has been brought to our attention time after time. The cause of unsuccessful breast feeding is for the most part, if not entirely, traceable to lack of proper instruction during the first few weeks of life. How many cases are brought to us about the third or fourth month with the information that the mother weaned the baby about the second month because of the fact that the breast milk was not agreeing with it! Much could be done to save that most valuable food if we could see these babies during the first few weeks of life instead of after the mother had decided for herself. Newly-born services should have been established throughout the country long before now. It has been brought to our attention for many years in different pediatric sections.

The opportunity that such a service affords for the study of the diseases and peculiarities of the newly-born is inestimable. Our lack of knowledge is graphically illustrated by the short amount of space devoted to diseases of the newly-born in text-books on pediatrics. It is passed over rather quickly or perhaps limited to a few pages.

Dr. Fritz B. Talbot, Boston, Mass.—There is one period in the life of these infants that has not been taken into consideration, that is the period between the time that the baby is born and the time the pediatrist arrives. During that period many things can be done that make it very difficult for the pediatrist to obtain successful results. The principal factor that I wish to emphasize is the factor of exposure. I do not mean careless exposure of the baby after birth, but exposure during the bath. Whether it is the custom in the neighborhoods in which you practice to bathe the baby in water or not, I do not know. For a long time it was the custom in many lying-in hospitals. I wonder how many of you gentlemen have taken the trouble to take the temperature of that baby every hour from the time it is born until six or seven hours after the bath. I took that trouble several years ago and found that in a large number of babies,

the ordinary cleansing bath with the ordinary precautions in the ordinary heated room, subjected that baby to enough exposure to cause the baby's temperature to drop from a normal temperature of 98.6° F. to as low as 95°. It is not necessary for me to emphasize that such exposure is not good for the baby.

Dr. J. Ross Snyder, Birmingham, Ala.—I made the statement before this Section last year that I believed most expectant mothers were referred to hospitals by obstetricians for the benefit and comfort of the obstetrician rather than for the benefit of the mother and baby. That holds generally. If we carry out Dr. DeBuys' service to the newly-born I shall have to retract that statement, but a hospital conducted as his is the exception rather than the rule. The sooner we make motherhood easier the sooner we are going to overcome the resentment that exists against motherhood the length and breadth of this land. If we put a mother into a hospital where her husband has to pay $100 or $150 for a room and nursing, as much more for the obstetrician, as much more for the pediatrician, and then in a few years as much to the throat specialist for taking out the baby's tonsils and as much more to the dentist for taking care of the baby's teeth at so much per tooth, we are making a hardship of parenthood. We have to take that into consideration. The sooner this Section gets down and studies the economic side of this thing, the better it will be.

Dr. Eugene Rosamond, Memphis, Tenn.—The most important thing Dr. DeBuys has given us is the supervision of the milk production for the newly-born. It is the practice in my town for the obstetrician to take complete charge of this important function. I am glad Dr. Snyder spoke on this subject. I am glad that Dr. DeBuys claimed for the pediatrician the supervision of this function because the average general practitioner knows less about milk production than the average farmer. If the average mother got the same treatment that a fine Jersey cow gets, we should have more successful nursing infants.

The mother of every newly-born baby I am called to see is getting placenta extract until she is nauseated. This extract is given by the attending physician, with the result that she does not get three square meals a day. Stripping the breasts, a regular milking time and the simple things that any farmer knows are absolutely necessary for the production of a sufficient quantity of milk are absolutely lost sight of. The establishment of a service for the newly-born in every hospital throughout the Southland would do away with this most potent evil. There is less understood about milk production than about anything that the average practitioner comes in contact with. The rules are simple and plain.

Dr. J. O. Elrod, Forsyth, Ga.—I am not a pediatrician, but a plain country practitioner, and it strikes me that the country practitioners are not entering into the discussion of papers in this Section. I attended the Section on Obstetrics yesterday and heard puerperal fever cases discussed, and I could not understand it because I never see puerperal fever. I live in the country. Hospitals have many germs that we in the country do not get. In the country we have more obstetrics done by general practitioners than is done by obstetricians in the cities. Four physicians in my town work for about ten thousand people. I have not had to feed a baby artificially in so many years that I should not know how to start.

Dr. Marriott's paper seemed to be coming back to the old country practitioner's way of feeding babies. We cannot figure out percentages. I never did try to learn it.

The women that we care for in the country have not a chance in the world to have a pediatrician for their babies and we have no artificially fed babies. We train our mothers to feed their babies from the breast. We do not let them stop nursing. We make them strip the breasts. Sometimes we have to give a little supplementary feeding to finish out a feeding. We make them nurse as much as they will from the breast, and if they do not get enough we feed them half milk, half water and a little cane sugar. I insist that the baby get plenty of water.

Dr. George C. Mosher, Kansas City, Mo.—We have always had in our charity service the assistance of the pediatrician. I could not gain from the Doctor's paper whether he limits this work purely to charity patients or whether it is given to all classes of society, rich as well as poor. We call the pediatrician into consultation immediately if any indication arises. The care of the baby, in the first few hours of its life in our charity service, is under the supervision of the obstetrician and the pediatrician. The same holds true in private hospital service. The first few days the baby is under the care of the obstetrician with the pediatrician as a consultant. It seems to me that when we come to insist that as soon as the navel is cut the baby becomes the property of the pediatrician we are making a mistake. What opportunity has the pediatrician to know about the mother's blood pressure and her previous feeding? It is the feeding of the mother and the care of the mother that the general practitioner has to look after, and he naturally does not have the pediatrician at his hand. He has to do his own work. Naturally he becomes a specialist in all of these lines. He becomes his own obstetrician and his own pediatrician. As the interesting paper of Dr. Marriott brought out, we come back to the simple things to get success. It is a question whether it is wise to place the care of the infant beyond the control of the general practitioner except in a city charity service. He takes care of 70 per cent of all infants that are born in this country. If as soon as the cord is cut the child is turned over to the pediatrician, what is going to become of the general practitioner who has no pediatrician within fifty miles?

Dr. W. McKim Marriott, St. Louis, Mo.—I want to disagree with Dr. Elrod. He said he did not have a pediatrician in his town. He is a very good pediatrician himself, for he follows the first rule of a good pediatrician, namely, "Do not wean the baby!"

Dr. Buford G. Hamilton, Kansas City, Mo.—Conditions are such in Kansas City that the

obstetricians care for the majority of new-born babes, at least while the baby is in the hospital. I should be very glad if it were possible to refer each babe to the children's men immediately. It is easy to do this in charity work, but as yet not in private work.

There is no doubt that there is a wide difference of opinion between the obstetrician and the pediatrician concerning the management of the new born. This we think can be easily overcome by closer cooperation. Probably the pediatricians will soon arrive at some uniform plan of management, the thing that has not been done up to the present time.

Dr. Neff, of Kansas City, has been attempting for the last two years to bring about just such conditions as the Doctor suggests. We both realize that as yet the new-born baby is cared for not by the specialist, but by the general man, and probably will be for some time to come. That those handling the new-born may have a better understanding of the conditions occurring in infancy, charts have been placed in the St. Joseph, Christian Church and the general hospitals showing the following things:

Date of birth.
Weight at birth.
Weight yesterday.
Weight today.
Temperature, pulse, respiration.
Stools—Number, character.

Spaces are left showing the condition of the mother for the previous twenty-four hours.

All cases are kept on the same chart so that comparison can be made from day to day. The babies that are not doing well are in most cases referred to the pediatrician. This is a step in the direction the Doctor suggests.

It is a fact that the children's men do not appreciate the mother and neither do the majority of men appreciate the new-born.

The breasts should never be pumped, but when it is necessary to express the milk it is easy to do it with the fingers.

That we may have better babies and better mothers, I heartily agree with Dr. Mosher that "prenatal care is the real factor."

May I again emphasize the necessity of closer cooperation between the children's men and the obstetrician. If this can be accomplished, there is no doubt that both baby and mother will receive better care.

Dr. Oliver Hill, Knoxville, Tenn.—I should like to ask Dr. DeBuys if the same condition obtains with pay patients as with charity patients, and to take issue with the two gentlemen who have just spoken. When Dr. Hamilton has a baby who is persistently losing weight and has a temperature he calls in the pediatrician. In other words, after the damage has been done he calls the doctor. If Dr. Hamilton or any other obstetrician is sufficiently trained to care for the newly-born, all is very good. Of course, after the baby has become really sick most of us would be glad to let the other fellow have it. A baby with a temperature or a really sick infant is a big job for anybody.

The majority of the cases come under the care of the general practitioner in the beginning. The obstetrician must not expect excellent results or startling results when he waits until the symptoms appear or until the baby is beginning to feel a little ill before calling in the pediatrician.

Dr. W. A. Fowler, Oklahoma City, Okla.—We sometimes make a very bad mistake in allowing ourselves too little latitude as to just when we should be called. It seems to me that as long as the vast majority of new-born babies will be under the care of general practitioners it would be more profitable if we instructed the general practitioner in the proper routine in the care of the new-born baby. In Oklahoma City we have a most happy cooperation between the departments of obstetrics and pediatrics. Our routine standing orders for our nursery are approved by our pediatrician. We ask our house doctor to inform us about anything for which the pediatrician should be called. If the baby does not gain weight after the fifth day the pediatrician is called. If the baby does not seem well from any cause, or if there is any condition that needs care, the pediatrician is called.

I do not believe the obstetricians are anxious to have the care of these babies, but I do not believe it is wise to hand over all new-born babies to the pediatrician. In the nursery we can weigh the baby every day and have observations made as to conditions which might arise. The time is not ripe yet for a practically normal new-born baby to be put under the care of a pediatrician. We tell our mothers after they go home if the baby cries to call the pediatrician, or if the baby is not gaining to call him. If we instruct our general practitioners as to the routine in the care of the baby and as to the signs that might be an indication of possible danger, that is a field of real usefulness. The obstetrician ought to instruct the general practitioner, not that every case should go to the obstetrician, but that he may recognize the pathologic conditions which need the care of an obstetrician. I believe in that way we shall do our patients more good. This principle, it seems to me, should apply to pediatrics and other specialties.

Dr. E. A. Hines, Seneca, S. C.—Dr. DeBuys has the opportunity to do much for the profession of this country by pushing his newly-born service to a point where it will be developed in every medical school in the United States. The trend of American medicine in the future will be toward the training of more and better general practitioners. The general man for generations to come will be the obstetrician for almost every community. The well trained general man in every community will also have in the future an important field for his skill in preventive pediatrics.

Dr. Calvin R. Hannah, Dallas, Tex.—I must commend the ideas Dr. DeBuys has presented. I have for a long time believed that there are too many babies left in the hands of incompetent physicians. This is a day of specialization.

While Dr. Talbot may have said that the time from the birth of the baby to the arrival of the pediatrician is worthy of consideration, especially in asphyxiated cases, yet we must not forget that the new-born is nine months old when delivered. During this period the ob-

stetrician is responsible through his pre-natal care.

The obstetrician should have a thorough knowledge of the mammary glands and should see that an inverted nipple is properly corrected so that at delivery the gland may begin properly to function. The obstetrician and general practitioner both feel that the patient should come to us in time that we may properly supervise her during the period of gestation. To me, this is an ideal preparation for her future lactation. A woman in poor health and improperly handled during gestation and injured at the time of delivery oftentimes has trouble in nursing her baby. Pediatricians in their private practice and in their public welfare work should cooperate more with the obstetrician by advising and instructing the public that it is absolutely necessary for child hygiene that the mother should be under the supervision of an obstetrician.

I am wondering if the pediatricians know the statistics that out of every 200 women delivered 10 of the babies die. Approximately 3 of these die at birth or the first day. The next greatest mortality is the first week. Fifty per cent of the babies that die, die during the first thirty days. This is due to poor obstetrics, no prenatal care and constitutional diseases with which the mother is afflicted.

The obstetricians are appealing to the pediatricians to assist in correcting this neglect, for they, being before the public in welfare work, are granted the opportunity to present this subject matter to the public. The obstetricians, if supported by the pediatricians, are willing that the babies from birth shall be supervised by the pediatricians.

Dr. DeBuys (*closing*).—It will be difficult for me to answer every remark that was made. Nothing is further from my mind than not to enlist the entire cooperation of the obstetrician and the pediatrician. I was talking purely of the charity service in which there were no dollars and no cents. We are trying to work out what should be done with the babies. I do not believe that we can give certain danger signals for the obstetrician to follow and to assume the responsibility if he does not see these danger signals. If we are to assume this responsibility we should at least see the baby. I want to impress firmly on the obstetricians that we pediatricians want to cooperate with them in every possible way. We have learned from experience, and from statistics, what has been wanting in the past. A study of infant mortality has convinced us that the baby needs special care in the first few days of life. In investigating the text-books one is impressed with what little has been done in connection with the newly-born.

It seems to me that the work can be done in one of two ways: the old way in which practically nothing was done for the child, or the other method as I have outlined it in my paper.

Could you, in your hospitals, general or obstetric, point with pride to what is being done for the newly-born? I have been studying newly-borns for years. Recently I have gone into some of the finest obstetric hospitals in the country and have seen what is being done for the baby. I need not tell you that it is practically nothing. Of course there is a little glass room off somewhere in which the baby is put after it is born. The mother is attended to, and after a while the baby is brought in.

By the plan suggested of caring for the baby at birth we begin as soon as the cord is cut. There is no interval. I have seen many of these babies at once. I hold myself in readiness to see them at any time. The baby is not bathed until directed. There are sufficient standing instructions for the baby until seen by my staff.

The newly-born service seems to be appreciated by mothers of these infants. The last Thursday morning before I left New Orleans we had thirty newly-born babies in our Clinic. That is sufficient proof for anybody who knows anything about outside service. One working woman with two previous children, whom she was unable to nurse, remarked with a great deal of gratification, "Doctor, I am able to nurse this baby." We do not wait until the fifth day to begin our work; we do not wait until the baby begins to lose weight; we start in the beginning. We are trying to practice preventive medicine. Another poor mother said, "I am able to nurse this baby and I can sleep at night. I was unable to nurse my last two because I was up at night." The babies in this institution leave with good habits. They are properly trained in the hospital.

In regard to the nurse, we see many nurses who are married and some who have married doctors. I find that they know as little about the care of babies as the mother who has had no nursing training. They learn nothing of the diseases of children nor of the newly-born while they are in the hospital. They do routine work which amounts to nothing.

It was with a great deal of pleasure that I showed one of my young mothers, a private case, through the newly-born service. She said, "Doctor, these newly-borns receive more attention than private patients do."

TROPICAL DISEASES AND PUBLIC HEALTH

THE RELATIONSHIP OF LOCAL, STATE AND FEDERAL AGENCIES IN VENEREAL DISEASE CONTROL*

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The protection of the public health is an inherent responsibility of any democracy. Just as criminals are not allowed to rove at large and endanger the lives and property of citizens, so should those suffering with dangerous communicable diseases be prevented by the health officer from coming into contact with those who are free from disease. Healthy people should no longer permit themselves to be infected from an impure water supply or from inadequate drainage. The public has a right to protection from fire by the fire department. It has a right to protection from crime by the police department, and it has a right to protection from disease by the health department.

The general public is, moreover, beginning to realize that it possesses such a right. The dawning of such a realization in the minds of people is shown by the present day interest in health matters resulting in the formation of health societies, the increasing sale of books on health, and more directly by the development of adequate local, state, and federal health organizations.

Government health agencies should have progressively developed from the local to the state and from the state to the Federal health service. This is the normal process of evolution, health work being pre-eminently a local matter. The health work of each community should obviously be handled as far as possible by that community and paid for also by those benefiting by the work done. Matters that are more than community matters, those that affect other communities or pertain to the state should in turn be passed on to the state department of health. The Federal health service stands in its relation with the states somewhat as the state departments of health stand in their relation to the local health departments. Its functions are chiefly advisory and co-operative, but there are, of course, certain inherent duties on account of its national character. The Federal health service possesses certain police powers, investigative and demonstrative functions.

The development of the Public Health Service during recent years has been the direct result of the expanding interest and understanding of the general public in all health matters, and their growing demand for protection from disease. This demand of the public has resulted in Congressional legislation to develop adequate facilities for protecting the health of the people of the United States.

The Public Health Service had its origin in the old Marine Hospital Service, which was first authorized by Congress by the Act approved July 16, 1798. This Act made provision for the medical care of sick and disabled seamen of the American Merchant Marine. The evolution of public health functions from such a service was along natural lines. The medical officers, in providing care for the American Merchant Marine, were often the first physicians to detect such diseases as cholera, yellow fever, smallpox, and the like which were being imported into the United States. This priority in the field naturally led Congress to impose the quarantine and immigration functions of the Federal Government upon this Service.

The Service was later utilized by Congress as a Federal health agency for the prevention of interstate spread of disease; and again still later Congress imposed upon the Service the duty of investigating the diseases of man and the dissemination of public health education and health information, and most important of all, the duty of co-operating with state and local boards of health in health mat-

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ters. Under these broad authorities the Service had prior to the World War developed into an organization doing work in preventive medicine in broad fields. In its work it has aided the states in problems which local communities should not be required to solve single-handed. Work of this nature includes the extensive investigation and demonstration in rural sanitation, correction of polluted water supplies, studying industrial health conditions, and working on the problems of malaria, hookworm, trachoma and pellagra.

When this country entered the World War certain health problems came into prominence which could best and most promptly be dealt with by a Federal agency. The Service was given additional duties and underwent further development.

When a cross-section of the young men of the country was examined for the draft and it was found by a casual inspection without laboratory tests that between 5 and 6 per cent were infected with either syphilis, gonorrhea or chancroid, this condition aroused public opinion and legislation was demanded to combat it. This resulted in the creation in July, 1918, by the Chamberlain-Kahn Act, of the Division of Venereal Diseases in the Public Health Service. In this Act the duties of the Division are defined as follows: to study and investigate the cause, treatment and prevention of venereal diseases; to co-operate with the state departments of health for the prevention and control of such diseases within the state; to control and prevent the spread of these diseases through interstate traffic. The relationship of the Division of Venereal Diseases to the states is thus clearly defined in the Act creating the Division as one of co-operation, a relationship which is maintained not only by this Division, but by the entire Public Health Service.

In carrying on the co-operative work in the various states, provision has been made for an officer of the Public Health Service to have charge of the details of this work in each state. These medical officers are selected by the various state health officers and recommended to the Surgeon-General for appointment as the state venereal disease control officer. This results in a very effective decentralization of the administrative work and places the responsibility for the direction of the work in each state upon an official selected by the state and representing at the same time the Public Health Service. The zeal, loyalty and energy displayed by these joint state and Federal representatives has made possible the progress that has been made in venereal disease control throughout the United States during the past three years. This method of managing the program is in accordance with the accepted general principle in this country that the control of disease is primarily a local function which should be exercised by local and state departments of health.

The entire venereal disease program has been carried on with this as the basic idea, and the medical, law enforcement and educational measures have been conducted through the co-operation of the states, the aim being to turn over more and more of the work to the states as they develop facilities for meeting the problem. As a proof of the success of this policy one may cite the stimulating effect on the states of the aid offered by the Federal Government for the purpose of venereal disease control and the cordial relations existing between the Division of Venereal Diseases and the various state departments of health.

The value of Federal and state co-operation in combating all forms of communicable diseases is obvious. In the case of the venereal diseases, for instance, this co-operation has made it possible to put into effect a uniform, balanced program for venereal disease control throughout the United States. In each state medical, law enforcement and educational measures are being carried on simultaneously, and each state has adopted a plan founded on the best thought and experience of experts. Medical, legal and educational standards have been developed and have proven of great value to the state departments of health. It has been possible also through the consultation of specialists to formulate practical standards for the treatment and cure of venereal dis-

eases, and for the equipment and conduct of clinics. Model laws were devised and proven efficient in preventing anti-social acts and so in reducing opportunities for the spread of venereal disease. Educational material such as pamphlets, exhibits and motion pictures were standardized and are used by many of the states in common.

The state departments of health have been cordial advocates of the Federal program, and any opposition that has developed to the program of venereal disease control has been by individuals and has been founded on a misconception of the object of the work. While many of the best physicians in the country have appreciated the aim of the Government program, and have given unstintedly of their time and advice, often at great personal sacrifice, and while many others, though making no personal contribution, have aided the Government by a generous backing of its policy, there are a few physicians who are opposed to the venereal disease clinic, because they fear that such clinics will make inroads on their practices. As a matter of fact, if these physicians would study the actual results of the establishment of a clinic and the undertaking of educational work in a community they would realize that an intensive educational campaign means for them more patients instead of fewer, and that patients who are able to pay for treatment will consult the venereal disease specialist, or will be referred to him by the clinic. Moreover, these same physicians should realize that by the free clinic in the community they will be relieved from the moral obligation of treating indigent patients in an infectious stage of venereal disease.

The responsibility of each and every private physician for the health of his community is a phase of medical practice which receives too little attention. A doctor who properly examines the patient and prescribes suitable treatment for a communicable disease has by no means discharged his professional obligations. The most important duty he has in such cases is to see that the disease does not spread to others. This can usually be accomplished by proper instruction to the patient and by insisting that proper precautions be observed to prevent his becoming a menace to the community. Proper precautions of course include the treatment of infectious discharges from the patient and such measures as are necessary in regard to isolation, quarantine or restriction of activities. Cases of all communicable diseases should without exception be reported to the state or local health authorities as required by law or regulation.

These three things, instruction of the patient, proper measures for preventing spread of disease, and reporting, are certainly important in relation to venereal disease control. In fact, the ultimate control of venereal disease can be accomplished only through the sympathetic cooperation of the medical profession.

A brief account of what has been accomplished in venereal disease control during the past three years will show better than any description the relationship that exists between Federal and local agencies in this important field of public health.

The prevention and control of venereal disease has been sought (1) through fostering the passage of laws in the various states aimed to reduce anti-social acts which increase the spread of these diseases; (2) by the cure through clinic treatment of persons infected when they are unable to pay for treatment, in this way preventing the dissemination of infection; and (3) by educational activities aiming to interest physicians in the latest methods of treatment and the importance of reporting these diseases; to inform the general public of the dangers of venereal disease and to promote through sex education the giving of a proper attitude to children in matters of sex.

Every state is now co-operating with the Public Health Service in venereal disease control, the District of Columbia being the only exception. For the fiscal year 1921 the Federal appropriation to state boards of health was decreased to $450,000 from the $1,000,000 made available by the Chamberlain-Kahn Act for each of the previous years. This amount plus the balance of $96,345.30 remaining

from the 1920 appropriation was apportioned to the states and their receiving it made contingent upon the raising of a similar amount within the states. For 1921, 47 states qualified, Idaho being the only state that failed to secure Federal funds. The State Board of Health of Nevada adopted the regulations promulgated by the Secretary of the Treasury for venereal disease control late in June, 1921, and Idaho has state money now available which will entitle the State Board of Health to the Federal allotment. The District of Columbia has yet failed to qualify, but two bills covering such requirements are now before Congress. State appropriations to carry on the work of the state boards of health were made in 37 states, amounting to $1,078,653.17 for the fiscal year 1922, so that the work will be continued, although no Federal appropriation for the states was made for 1922.

Legal advice, when requested, is furnished to the states by the Division, and during the past year 40 states enacted legislation for venereal disease control, showing an appreciation of the importance of such measures. An analysis of laws passed showed that eight states provided for the prevention of ophthalmia neonatorum, 5 states passed the standard venereal disease control law, while 3 states amended their law, 6 states passed laws prohibiting persons with venereal disease from marrying, and 7 states made the advertising of venereal disease nostrums unlawful.

The co-operation of state and Federal agencies on the medical side of the program is exemplified by the clinics for the treatment of venereal disease which are operating under joint auspices of the state boards of health and the Public Health Service. The number of these clinics and the amount of work done by them has increased steadily every year in spite of the fact of decreased Federal allotment during 1921. These clinics numbered 237 in 1919, 427 in 1920, and 483 in 1921. During these years 167 clinics, 383 clinics and 442 clinics reported their activities. During the same period the number of new patients admitted increased from 59,092 in 1919 to 126,131 in 1920, and to 140,748 in 1921. The number of Wassermann tests and the number of microscopic examinations for the gonococcus reported by these clinics have also steadily increased. In 1921, 251,885 Wassermann tests were reported and 185,325 tests for the gonococcus. The efficiency of reporting of venereal disease to the state boards of health has also increased. In 1919, 239,502 cases of venereal disease were reported; in 1920 there were 326,117 cases reported, and in 1921 there were 434,606, an increase of 35 per cent. Of the cases reported in 1921, 203,281 were gonorrhea, 217,812 syphilis and 13,606 chancroid.

In all, during the three years of existence of the Division, 1,000,323 cases of venereal disease have been reported, 325,971 patients have been admitted to the clinics for treatment, 491,686 Wassermann examinations have been carried out, and 430,019 tests for the gonococcus made.

The state boards of health report 532,778 doses of arsphenamin or similar product distributed during 1921, an increase of 204,396, or 62 per cent over 1920.

An outstanding feature of the medical and educational work of the Division during the past fiscal year was the Institute of Venereal Disease Control and Social Hygiene held in Washington November 22 to December 4, 1920.

The aim of the Institute was to make available to those employed by state and local authorities for venereal disease control the most recent contributions to knowledge and experience along these lines, and to enable them to come into personal contact with those recognized as the highest authorities on the various phases of the work. The courses offered included diagnosis and treatment of syphilis and gonorrhea, with clinical demonstrations, clinic management, the delinquent and the law, the psychology of the delinquent, sex in relation to education, sociology and social hygiene, methods of public education, and others.

To give this instruction 54 of the ablest men and women of the country were secured. Lectures were followed by round table discussions. More than 600 persons attended the Institute instead of the 200

for whom plans were originally made. Those attending came from all parts of the country and included health officers, physicians, nurses, social workers and many others.

A few of the states have since held institutes of their own, and the Service is planning for 1922 a series of institutes on venereal disease or general public health, to be held in two different cities of the country with the co-operation of the state boards of health, for the benefit of those wishing to study the many phases of present-day public health problems.

During the three years' work of the Division an intensive educational campaign has been carried out. Effort has been made to reach large numbers of persons not only through institutes but by means of pamphlets, lectures, motion pictures, exhibits, posters, placards, advertisements, and press articles. In this time 26,339,883 pamphlets were distributed; 29,560 lectures were given, reaching 4,659,025 persons; 5,239 motion picture showings were made, reaching 1,987,266 persons. This work was possible only through the co-operation of the state boards of health, and as time goes on the state boards of health will naturally assume an increasing proportion of the program.

It is, however, believed by those directly engaged in venereal disease control work that for a few years more many of the states will require Federal aid in order to make permanent the gain that has already been made in this important field of public health work. This aid will enable the states to educate the people to a further realization of the value of the work that is being done and to a willingness to appropriate funds for such work.

There are now on all sides signs that encourage those engaged in the field of preventive medicine. The people of this country are undoubtedly coming to realize more and more clearly that they are entitled to proper health protection and to obtain adequate protection must support, first their local agencies, secondly the state boards of health, and finally the Public Health Service. The only way in which this protection can be assured is for all these agencies, with the sympathetic co-operation of the private physicians, to work together each in its own field for the well-being of the public, not so much for the cure of disease, although that certainly is important, but for the prevention of disease and the maintenance of health.

DISCUSSION

Dr. C. W. Garrison, Little Rock, Ark.—I wish to mention the first point here: "Governmental health agencies should have progressive development from the local to the state, from the state to the Federal health department." That seems fundamental, yet we find it is necessary for the Federal agency, or the superior agency, to come and create a sentiment for a proper character of work in the smaller units; for the local government to call upon the state and the state to call upon the National Government for assistance in enlarging this program.

Dr. Pierce spoke of the growing demand upon Congress for increasing appropriations. Congressmen represent their constituency throughout the United States. The congressmen and senators from Arkansas, as from other states, consider this program largely in keeping with the sentiment of their constituency.

Too frequently we overlook the value of legislative sympathy and the value of the support of those whom we like to term politicians, for we are bound to admit that politics controls this entire country. It controlled the signing of the Armistice. It will control this Disarmament Conference in session. We can not overlook one of the potential agencies of retardment or advancement of any health movement we may inaugurate.

We should work also "by educational activities aiming to interest physicians in the latest methods of treating and the importance of reporting venereal diseases." I can not stress too much the very great need for information reaching the general practitioner. In Arkansas one of my big problems in carrying out this venereal disease program is in having available in the smaller towns and rural districts competent physicians to carry out effective treatment.

Dr. Pierce spoke of the establishment of clinics and of the educational feature of the work for physicians. That is why we have all worked so hard to establish the clinic in a public bath house, which was yesterday dedicated to suffering humanity. There we hope to create, as was suggested by Dr. Pierce's statement yesterday, a school of instruction for those who come: instruction from men who are highly trained in the treatment of these diseases. It is a school of instruction offered to those physicians who have not had the opportunity thoroughly to qualify in the latest technic in the treatment of these diseases which is so very important. That in itself justifies the continuation of this work, because when any physician goes to any school of instruction in any particular line it tends to broaden him. He gets more than the thing for which he attended and becomes a more proficient physician, better able to minister to the needs of his community.

This State has very greatly benefited by the legal advice sent from Washington. In a number of instances we have needed it and they have sent their ablest attorneys to this City on several occasions to advise with us on matters involving legal procedure. We have in a number of instances been able to enforce the interstate quarantine law in regard to venereal diseases, especially in our border towns.

The commercial prostitute is undoubtedly a factor in the spread of these diseases. When a commercial prostitute comes into our border towns or any town direct from another state, we try and do apprehend her in many instances and place her under quarantine, and then call on the Federal authorities to come down and get her. It is a simple matter to place her under quarantine, and there is a law in effect that enables the Government to place her in a hospital in another place. It takes her off our hands and out of society. We all enjoy an opportunity to "pass the buck."

We have also discovered one thing, I think, that possibly we are not all aware of, and that is the real extent of the authority of the health officer. More than one instance has arisen in this State where the local health officer, advised by the State Health Officer, placed under quarantine venereally infected person. Immediately some lawyer attempted by habeas corpus procedure to remove her from the jail or imprisonment or from quarantine. It was with astonishment that the lawyer for the first time in his life waked up to find that he could not take a person under quarantine out of quarantine by legal proceedings. The courts in this State have sustained that action, holding that only the health authorities who instituted the quarantine had jurisdiction to remove it. That is worth a great deal to us.

Dr. J. S. Mitchener, Raleigh, N. C.—I see a favorable factor in a relationship in venereal disease control with the U. S. Public Health Service and the state, not only because the Service furnishes part of the funds, but also the Service can be made to share responsibility. Often we can make demands on the clinics for monthly reports and promptness and accuracy in them, because we can say that the Service has authorized us to discontinue furnishing clinics with therapeutic preparations unless they comply.

With the location of a clinic at Hot Springs, Arkansas has a very good opportunity to train physicians in the proper treatment of syphilis and gonorrhea. To train the physicians, however, you must get them to come to Hot Springs, and I fear this will be a difficult thing to do, especially in cases of the physicians in small towns and rural sections where the field is ripe and practically no harvesters.

I am at present trying to work out a plan to get treatment at a price which all can pay. My first step in this plan is to send a physician to a county to see the extent of the prevalence of venereal diseases and hoping to prove to one or two local physicians that they can make money by treating a group of patients at a group fee who are not able to pay a high fee for individual service. In other words, I want to get facts before I ask a county for funds or facts before I ask a physician to do a given piece of work. When we get facts we can get an appropriation or can interest physicians in treating a group of patients.

The sooner we get our people to see that gonorrhea and syphilis are diseases like typhoid and pneumonia, the better off we will be. We must make them realize that these four diseases need thorough and adequate treatment, and while two of them may cause death within a short time, the other two play a part in a life spent in sickness, unfit for service and terminating slowly but surely in a premature death. The best way to get them to learn this lesson is to get them adequate treatment. I am not against education along venereal disease lines, but I am growing more and more of the opinion that we must spend more money trying to treat people in rural sections and stop talking so much or spending our money on treatment and not in lecturing, because it is going to be difficult to educate the masses on sex control, which is a problem for the schools or preferably mothers and fathers.

Dr. D. J. Williams, Gulfport, Miss.—I do not believe that the doctors or people of the country generally realize just what this campaign means. I met Dr. Pierce when this campaign first started with a committee of fifty. There was not too much enthusiasm then. But if we get no other good from the World War than that coming from the control of venereal disease, we shall be repaid for all the expense that we have incurred, including the unfortunate loss of many of our soldiers. As a member of the Draft Board, I saw the evil effects of venereal disease and wondered just what was going to become of us.

Our town is a railroad and a seaport center. In each kind of place venereal diseases usually find a favorable spot. We were enabled to control the prostitute, which is the greatest menace in the spread of this disease. We put them in jail and their attorneys tried to get them away from us, but we succeeded in holding them.

I understand that in our county the statistics presented are being questioned because of the fact that they have shown such marked improvement. In a population of approximately 32,000 we had, before this campaign was started, an average of thirty-five or forty cases of venereal disease reported each month. For the past six months we have been running on an average of about five or six cases. We get excellent reports from our doctors. Of course, cases may fall into the hands of the negro, some quack individual, or be self-treated, and under conditions of this kind will not be reported promptly. We can not get them at the outset, when we ought to have them, but eventually we do get reports of these cases.

I have indexed all my venereal disease cases. I know every one that has been reported in the past four years in my county. If I do not get a report of the fellow who has the acute stage today, I get him five or six months later. We finally get a knowledge of his condition.

Another good thing which has been the result of this campaign is this: I have to admit that I didn't understand the handling of venereal diseases so well before this campaign as I believe I understand it today. This movement has been an educational one to the physicians, for we now know better how to handle them than we previously did. We do not need to send them to Hot Springs. We are also able to cure thousands of cases where before we made many failures.

In our anti-venereal work, or campaigns, I have found that some of the most profound thinkers in our State have been fearful of the result of the absolute abolishment of the houses of prostitution. I have no doubt that it is the proper thing to do and you may have no doubt about it. But this doubt does exist in places where you would least expect to find it. I suggest to Dr. Pierce that he get out some propaganda that will do away with the idea that the sanctity of the home is going to be disturbed by fighting prostitution.

Dr. G. H. Benton, Miami, Fla.—A great deal of progress is being made through the work upon venereal disease problems and particularly through the wonderful work that was done within the military organizations. As evidence of this, I call your attention to the things I have observed among a class of patients that one would think should be the least impressed. These are the patients coming into the neuro-psychopathic hospitals with more or less retarded mental development and reduced intellectual capacity; the class of patients who, while they know right from wrong, have no knowledge of the value of an anti-social act; the man who responds always at the level of the sensual and sentimental states, who has no inhibition to control or modify his desires, which make great demands for gratification. I noticed in history-taking a decided change of attitude in that since these men have been in service. A considerable residue of what was taught them still remains in reference to venereal disease, which gives an easier and better approach to them. You can write a sex history better than before their military experience. Previously the moment you mentioned anything sexual they would not respond, except only to show hesitation, timidity or embarrassment. They would not discuss it frankly as they do now. These men will tell you that they learned enough in their Army experience to keep away from temptation and not expose themselves to venereal infection. It is wonderfully gratifying to know that this has been accomplished, and if it can be accomplished among men of this sort, it must have made a very profound impression upon men who were much more responsible.

Dr. Hardie Hayes, Jackson, Miss.—Dr. Pierce said that we get our protection from the police against violations of the law and our health protection from the health officer. Many do not appreciate this distinction. For instance, I went to one of our large cities and there found an open red light district that they were all very anxious for me to close up. The Chief of Police had been instructed to close it, but did not wish to. I found that there were twenty-seven diseased people there and quarantined them; then the Mayor lent his support to closing up the district. When the people in that section found out that there were active depots of infection there, he knew that he dared not stand out against the protection of the people's health.

We must differentiate between our authority as health officers and the police power. I have under observation now—and I am watching with interest—an instance where a lady complained to the Surgeon-General's office that there is a house of prostitution being operated behind her dwelling. She asked for relief, but upon repeated surveys of that place we can not find any disease in the house. We can not find any reason for going into that house for a medical examination and the police will not do their duty. Some of the members of the police force have advised this party that we have no right in the world to enjoin her and that she could stay there forever. To enjoin her, even though she be known as a prostitute, we must get some citizen of that county to make the complaint. We can not get that.

If we, as health officers, start in to close up a district or stop a depot of infection, we must respect the idea that the police power must be administered by the police and that the quarantine power is to be administered by the quarantine officer. We get into trouble whenever we try to administer the police power when we have not the evidence of diseases being spread or existing.

Dr. Valeria Parker, Washington, D. C.—There is no question that the social hygiene program during the war has put the local work and the social work ahead by a great many years. I am hoping very strongly, as I know each one of you health officers is, that Congress may see fit to reappropriate the funds for venereal disease work in the states for another year. Our Board is in accord with the wish of public health officers to have this same appropriation, and we hope it will be administered by the Public Health Service and not by the Board as in the past. The program with which our Board is concerned is the facing of several of the problems which have been brought out today.

First is this matter of the detention of women. As most of you know, we are concerned with trying to eliminate the prostitute in those districts frequented by sailors and soldiers. We have discovered that you can not get rid of venereal disease among prostitutes by treating them in the county jail. It is impossible. There were several factors involved which I shall not go into now.

First of all, you have the fact that the women are not of the same degree of experience in lawlessness and that during the intimate contact between these women in the jail corridors in absolute idleness the girl who has just begun perhaps comes into contact with the more hardened woman who teaches many things not known before.

There is the further fact that there is little done to examine into the individual history of the girl or woman in order to find out what the past environment was and what the future disposition of the case may be. We find it absolutely necessary to have a social worker in connection with clinics, who will get the past history and take an interest in the future disposition of the case, who will search for an environment and influences which will help this woman to keep straight after she goes out instead of going back into the old life.

In Hartford, Conn., we had an excellent illustration of what may happen in the jail. There was one woman who had been in a hundred and twenty-six times, not for venereal diseases, but for drunkenness and prostitution. I was unable to find whether she had venereal disease or not. She was never examined. Most of the cases under treatment are not bed cases and these women have long hours of idleness. There must be some provision made for occupation of the girls' time. We are finding more and more that the county jail will not serve as detention quarters. We must get the women outside of the city where they are not conspicuous to the eyes of everybody in the town. Several cities have already made excellent provision along these lines such as the Detention Home near Portland, Ore., and many others which I might name. It takes time for a community to see the value of this thing.

There is another thing we are trying to emphasize. It is true, as another physician stated, that we find in many high places the opinion still existing that somehow these houses of prostitution are necessary, that if we banish them entirely the prostitutes will come into the residential districts, that somehow there is a natural need on the part of men that requires periodic, though illicit, satisfaction. I want to call your attention to a book just off the press called "Prostitution in the United States." It is the first of two volumes being put out by the Bureau of Social Hygiene. It is one of the series of which Dr. Flexner's investigation of prostitution in Europe was the first. Some of you may know of the investigation in New York City, but this is on "Prostitution in the United States" by Prof. Howard B. Woolston, formerly of Columbia University, now at the University of Washington. He gives all the arguments necessary to convince an intelligent person that we can not play with this problem of vice any longer.

I want to assure you of the co-operation of our Board with the health officers in those states in which our agents may be situated, and of our full support of the venereal disease program in which we are all interested.

Dr. Pierce (closing).—There was mentioned the importance of having available some place to teach modern methods of treatment. We have in Washington a small clinic school at the Georgetown University Hospital. That is available to physicians in that territory who are able to come to Washington and spend six weeks at their own expense taking the course. No fees are charged for the clinical course, and in addition to the work at the clinic, work is given at the Hygienic Laboratory in regard to the testing of the toxicity of arsphenamin, etc. We give lectures on educational and legal measures for venereal disease control.

Dr. Mitchener made an epigram when he said: Get the facts before you ask for funds. We are asking for funds from Congress for next year. If all of you state men get data showing the help the Federal allotments have been to your state and let us have it in such form that we can use it and give it to the local representatives, it will be a great help in getting Congress to renew the appropriation next year.

Dr. Williams mentioned the fact that many people in the South think it necessary to have a segregated district. We have sent out a questionnaire and in that questionnaire have sought to find what representative people think about prostitution. We sent it to mayors, chiefs of police, presidents of women's organizations and other prominent citizens in towns, and the overwhelming response was that they all agree that segregated prostitution should be done away with.

I was glad Dr. Parker mentioned the book she did, and any one who will read the book by Professor Woolston on prostitution will certainly get all the argument he needs to convince the thinking people, as Dr. Williams called them, or intelligent people, that those arguments are fallacies which state that a woman is in danger of being insulted and that the sancity of the home can be more easily preserved in those towns where they have done away with regulated vice than it can in a wide open town.

Dr. Williams also referred to the progress that has been made, and Dr. Benton mentioned the work done by the Army and Navy during the war. This should cause us not to be too proud of our present progress. Many times children grow up, attain a degree of success and forget the help of their people at home. The progress in venereal disease control in this country today is very largely due to the splendid attitude taken by our Government during the great World War when Baker and Daniels insisted that men in the Army and Navy be protected from vice conditions just as they were protected at home. Four million men in this country received instruction in social hygiene.

That is a leavening factor in the country at the present time. We must not forget what the Army and Navy did, what the American Social Hygiene Association did, and what has been accomplished by the Inter-Departmental Social Hygiene Board during the past three years. All of those are important factors in our present state of development. The Public Health Service has no desire to get the credit for progress made. We want to act merely as a co-ordinating agency for the activities of the state and local health boards.

A Member.—Dr. Garrison, in discussing your paper, mentioned something about the quarantine of the prostitutes and getting the Government to take them over. In Georgia we have two big camps on the State line, one at Overdun and one at Benning. I should like to know what he meant by that and what the procedure is.

Dr. Pierce.—The infected person does not necessarily have to be a prostitute. I should like to see a case made against a man to show how the interstate quarantine law operates. Several women have been convicted of violating the interstate quarantine rules by traveling between Oklahoma and Arkansas and have been sentenced by the Federal judge in Fort Smith, Ark., to one or two years' detention and were sent to a place in Iowa at Federal expense. What you have to do is to establish the fact that a person infected with a venereal disease in a communicable form and knowing that he or she has the disease traveled from one state to another without getting a permit from the health officer having jurisdiction of the territory from which the infected person went to the health officer of the territory in which he arrived. If you establish that fact, if you know of a case of interstate travel under those conditions, all you have to do is to go to the Federal District Attorney having jurisdiction over that part of the state and present the facts to him and he does the rest. The Attorney-General's office in Washington has sent a circular letter to all Federal District Attorneys with a copy of the Interstate Quarantine Regulations and the citations of previous decisions. If you find the Federal District Prosecuting Attorney does not know anything about this matter and says that you must be mistaken, wire us and we will ask the Attorney-General to wire him: "See my letter of April 17, 1921." He has the data. He may not have read it, but all Federal district attorneys have been ordered from Washington to handle these cases. If the Federal judge having jurisdiction sentences travelers to a period of detention they become Federal prisoners and are taken care of in a Federal institution not necessarily in the state in which the conviction took place. The judge can commit them to a suitable institution. The courts have already acted on this law and the attorneys for the persons at interest did not feel warranted in taking an appeal to a higher court because there seemed to be no likelihood that the higher court would reverse such a decision.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ACUTE INTESTINAL OBSTRUCTION*

By G. A. Hendon, M.D.,
Louisville, Ky.

The fact that the mortality of this malady is the highest of any curable abdominal crisis makes it deserving of our most careful consideration. In studying the subject it is well to bear in mind that obstruction of the intestines involves the interruption of at least three distinct currents. The vascular, the fecal and the motor. The vascular current is interrupted by torsion (twisting of the mesentery), by volvulus (axial rotation of the bowel) and by strangulation (constriction). The fecal current is interrupted by obturation which is produced by enteroliths, neoplasm, foreign bodies and stenosis. The motor current is interrupted by any influence that destroys the function of the motor nerves which inspire the peristaltic wave. This effect is brought about by sepsis, by trauma and by central lesions.

There is one form of obstruction that involves all three of the above mentioned currents, namely: intussusception. Torsion is generally found in the mesentery of the sigmoid on account of the disproportionate weight of this segment of the bowel in connection with the extraordinary length of its mesentery. Torsion may, however, occur in any portion of the intestine where the mesentery is unduly elongated. Volvulus occurs chiefly in the small bowel and may follow some specially violent type of sudden muscular exertion. Strangulation most frequently occurs as a result of the escape of a portion of bowels through a hernial ring, or by the bowel being snared by fetal remnants such as Meckel's diverticulum, or a fibrous degeneration of the appendix, or bands of fibrous peritoneum produced by a preceding peritoneal infection. Stenosis of the bowel rarely ever produces a sudden obstruction. It therefore, belongs more properly to a consideration of the chronic or incomplete variety. Obturation most frequently is produced by gall-stones which become incrusted with successive layers of fecal accumulation until they are too large to pass the lumen of the intestine. It is fair to presume that all enteroliths are produced in this way. Foreign bodies are rare as causes of obstruction, as anything capable of passing through the pylorus will also pass the ileocecal valve. Neoplasms in the form of polypi occasionally not only obturate the intestinal lumen but sometimes by their weight cause a gravitating invagination of the bowel. Masses of intestinal parasites, such as round worms for instance, have been known to block the intestinal canal. Fecal impactions I consider as the rarest of all causes of obstruction.

Sepsis is the most frequent cause of the deprivation of motor impulse and it occurs in any condition where a virulent type of infection or a very abundant quantity has been suddenly intruded into the peritoneal cavity. This form of obstruction is generally known under the name of ileus and is tersely expressed by the term "intestinal paresis." It is distinctly a non-operative but not a non-surgical lesion.

PATHOLOGY

The local changes which occur in connection with acute obstruction involve the contents and the wall of the intestines. The contents become suddenly and vastly increased in quantity and viciously altered in quality. The volume is immensely increased above the normal and it rapidly acquires toxic power by dissolving the pathogenic secretions of the intestinal flora. The bacteria, which normally inhabit the intestinal tract and under normal conditions are not only harmless but quite helpful in certain ways, under the influ-

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ence of obstruction rapidly assume pathogenic activity and acquire lethal properties with amazing rapidity. The wall of the intestine becomes thinned as a result of tension and disintegrates under the corroding influences of the secretions and the toxic effects of the contained bacteria and their products. The contents of the canal migrate through the intestinal wall and toxic material finds its way into the free peritoneal cavity. Multiplication of bacteria proceeds here with unbridled fury and absorption of toxins in unlimited abundance resulting in a general septic toxemia of the entire organism.

The changes in the wall soon become gangrenous, especially if the circulation is interfered with, and by an infective process thrombosis of the mesenteric vessels adds to the general wreck and carnage. At first furious efforts are made by the muscle wall of the gut to force its contents past the block by intensifying its muscular contractions. The intensity of this effort grows into an impotent frenzy of muscular activity until exhaustion supervenes as an inevitable consequence and the spent bowel lapses into hopeless relaxation. During these efforts the stomach, being the largest dilatation of the intestinal tract, constitutes itself a reservoir to relieve the bowel of the excessive load of liquid toxins. The pylorus, therefore, relaxes, the stomach wall distends, and the poison juices from the bowel below surge backward into the accommodating gastric cavity until its capacity has been exceeded and regurgitation commences to appear.

ETIOLOGY

Age: obturation by enteroliths and torsion of the mesentery of the sigmoid are incidents of advanced life while intussusception occurs in children under five years of age. Volvulus is incident to adult life, and so is strangulation, whether due to hernial inclusions, fibro-serous bands, or fetal remnants.

SYMPTOMS

They are few, three in number, very distinct and unmistakable. First, there is abdominal pain, excruciating in its intensity and paroxysmal in character, sudden in its onset. Second, comes nausea, which is characterized more by its persistency than by its severity. Third, there is the absence of any evidence of a tendency toward diarrhea. These three signs are amply sufficient upon which to base a diagnosis as well as to justify the claim of an abdominal section.

PROGNOSIS

Under the existing rule of custom the prognosis is exceedingly grave. There is a fifty per cent mortality. This, however, in the next decade will in my opinion be cut to ten per cent. The reason for such a frightful fatality lies partly in the fact that most of us are dangerously extravagant in our ambition to achieve an ultimate refinement of discrimination in diagnosis. We are unconsciously prone to demand a picture of disease that is complete in every detail before arriving at conclusions. It may be said in a spirit of admonition that the only hand that paints a perfect picture of pathology is the hand of death, and the only critic that applauds a work of perfect pathologic art, is the grave.

TREATMENT

If we wish to be more successful in the treatment of this disease than our predecessors, we must keep in mind the fact, in connection with acute intestinal obstruction, that it is one malady wherein the surgeon and physician both are guilty of serious errors peculiar to each. Namely, the surgeon does too much, and the physician waits too long to let him do it. The prime and predominant object in treatment is to empty the bowel of its contents above the point of obstruction. This can be achieved, first, by withholding food; second, by gastric lavage; third, by opening the abdomen and introducing into the distended bowel a Paul's tube and draining its contents, but never by purgation. If the patient's condition is the least bit uncertain no efforts at release of the obstruction should be attempted, but an enterostomy should be performed and the obstruction released at a subsequent operation. In the event that gangrene of the intestine has become established the Mikulicz operation should be performed without further manipulation. It is quite astonishing how important an element time proves itself to

be in treatment. The percentage of mortality is in direct proportion to the number of hours that elapse between the onset of the symptoms and the performance of the operation. In cases obstructed one hour there is shown one per cent mortality; two hours, two per cent mortality; three hours, three per cent mortality, etc. In searching for the obstructed bowel not over five minutes should be employed, and Moynihan has pointed to the fact that the obstructed loop of intestine is almost invariably to be found in the pelvis. My own experience bears testimony to this observation, also to the fact that the collapsed portion of the intestine invariably occupies the pelvic cavity. It is a notable fact that a bowel which is strangulated and becomes gangrenous outside the abdominal cavity is not so frequently fatal in its consequences as the same amount of intestine becoming gangrenous within the cavity. Hence the relatively low mortality rate of strangulated hernia. In every case morphin hypodermically sufficient in quantity to control pain should be administered after the diagnosis has been decided on. Under no circumstances should any effort at purgation be resorted to in the presence of an acute intra-abdominal lesion. All attempts in this direction should be limited to the use of a simple enema.

DISCUSSION

Dr. J. W. Barksdale, Winona, Miss.—Although the subjects of appendicitis and intestinal obstruction are trite, papers should be read on these two subjects at every gathering of medical men. The greater portion of our mortality in abdominal surgery is attributable to these two conditions. I regret that this paper could not have been read before a meeting of general practitioners rather than surgeons because, while I do not wish to absolve surgeons from responsibility, I believe the mortality comes about because the majority of these cases are not seen soon enough. A great amount of damage is done between the time of the inception of the attack and the time of operation.

The question of what to do for intestinal obstruction is as important as when to do it. We have all had the experience of operating upon cases of forty-eight hours' or more duration in which no particularly difficult surgical procedure was done. After the lapse of eight to twelve hours the patient collapses and dies, too early for peritonitis and not as the result of the operation *per se*, but on account of the release of a great amount of highly toxic material into a comparatively healthy and highly absorptive portion of intestine. Dr. J. W. Long, of Greensboro, N. C., has for some time advised a primary enterostomy in many of these cases, using the cautery for effecting the opening. I do not advocate that operation particularly, but I do believe that enterostomy is a valuable procedure in many cases. Too much surgery often kills these patients. You can tide them over the critical stage in many instances, and as Dr. Hendon has said, time will often do the rest for you. If you are able to operate within the first twelve hours, it is best to look for the pathology and remedy it if possible. If you are much later than this period, you had better content yourself with a primary enterostomy.

The Doctor did not mention post-operative obstruction. Too often this is attributed to an adynamic ileus when the underlying condition is a mechanical one. The obstructed loop will oftenest be found lying in the pelvis.

I want to emphasize what Dr. Hendon has said about unnecessary refinement in diagnosis. Abdominal pain that persists for eight, ten or twelve hours is in itself sufficient cause for an operation. If you are dealing with an acute surgical abdomen, do not hesitate to go in and examine. Often we find that we have been instrumental in saving lives from obstruction which would have been sacrificed had we waited to make an exact diagnosis.

Dr. John Darrington, Yazoo City, Miss.—In regard to post-operative obstruction I wish to say a few words, as I am one of the doctors to whom Dr. Barksdale referred. We, as surgeons, are all anxious to render better service, to improve our technic and to get better results. I do believe that post-operative obstruction is due in many instances to the kind of operation done. A refinement of our technic will give us better results. The many operations that are being done today under local anesthesia have proved of great benefit to the patient, because they have forced the surgeon to be gentle. It is shocking to see how rough some operators are. They pack dry gauze into the abdomen. It should be wet with plain water or saline solution. We should limit our packing as far as possible, handle the intestines as little as possible, and be sure that all rough surfaces are thoroughly covered. These three things are factors in producing post-operative obstruction: trauma, raw surfaces and low-grade infection. Watch out for these three things and there will be a great reduction in post-operative obstruction.

Dr. LeRoy Long, Oklahoma City, Okla.—In this connection it might be well to refer to the type of obstruction that takes place occasionally on account of herniation of a part of the intestinal tract beneath and behind the mesentery in those rather rare instances in which the mesentery is not attached uniformly from one extremity to the other. I have had two cases in which the mesentery looped over from its upper attachment at the left of the second lumbar vertebra to its lower attachment above the right sacroiliac synchondrosis, thus forming a sort of arch under which there was herniation of a large part of the small intestine. In one patient the hernia was reduced without any other procedure and death resulted from tox-

emia. In the case of the other patient, notwithstanding that the mechanical obstruction had been relieved, an enterostomy was done to relieve the toxemia, upon the assumption that there was present an adynamic condition of the bowel that had not been relieved by the steps employed to correct the mechanical obstruction. The patient recovered.

This brings me to the consideration of an important matter to which the author has referred which should be emphasized. That is that the primary duty of the surgeon is not, perhaps, to relieve the mechanical obstruction, but to do something to relieve and prevent the toxemia which must be anticipated in this condition of affairs. It should claim attention for two reasons: first, if the toxic material in the late cases, or in those with involvement high up, passes the point of obstruction, then the dried out portion of the bowel drinks it up and the patient dies of an absorption of a lethal dose. In the second place, in all these cases there is a distended, thinned out bowel with paralysis of the muscularis. Assuming that the lumen is open, there are still present obstructive symptoms in these cases on account of the temporary inability to move the contents of the bowel onward in a normal manner.

I have been particularly interested in post-operative ileus. In about a dozen of these cases referred to me during the last few years I have employed the technic suggested by Lord, of Omaha. A right rectus incision is made, the first loop of distended small bowel encountered is gently brought out of the wound, two purse-string sutures of small catgut are placed around an area with small needles, a slit is made into the bowel under proper protection, a large catheter with openings at both ends and side is introduced through it two or three inches, then fixed with one suture to the margin of the bowel, after which the purse strings are tied. The margins are invaginated in exactly the same way as in doing a gastrostomy after the technic of E. J. Senn. The intestine is fixed to the parietal peritoneum by one suture on each side of the catheter. That may seem a bit drastic, but we are dealing with a condition that leads to distribution, and something radical must be done if we are to relieve the situation.

It is particularly gratifying to see how these cases of post-operative obstruction, if operated upon early enough, get over the trouble.

I have not often found it necessary to do anything else. The bowels usually move in the normal way after a few days, which seems to be pretty clear proof that the obstruction was due to an adynamic condition of the bowel.

We would not have many cases of post-operative obstruction if we did not bother the intestinal tract. I mean by this that after abdominal operations the patient should not have a cathartic.

Dr. J. Shelton Horsley, Richmond, Va.—In the treatment of obstruction there is only one rule of thumb applicable to all cases, and that is to operate as soon as possible. After that, make the operation fit the pathology we find. In the post-operative type occurring a few days after operation the cases are due to mechanical obstruction from lymphatic adhesions which bind the intestine to some extent, or the intestines are probably weakened from the abdominal operation or infection and are partially paretic. It takes very little sometimes to obstruct the bowel. If we do an enterostomy here, it is often all that is necessary. If we attempt to break up the lymphatic adhesions we get worse results. We do not have to put in a large tube to take care of solid or semi-solid matter, but an enterostomy with a fairly large catheter introduced with the indirect method of Coffey can be dropped back into the abdominal cavity without any fear of leakage. If we wish to be particularly careful, we take a little piece of omentum and suture it over the enterostomy.

Peristalsis, in order to drive on the fecal current, does several different things. First of all, Nature tries to overcome the obstruction just as the heart does in obstruction as in physiological problems of obstruction that we have everywhere. The increased peristalsis produces increased pressure and that produces increased absorption in the intestinal mucosa. Consequently, not only is there absorption of the fecal toxins, but of other toxic materials that under ordinary conditions would not be absorbed to any extent. If the obstruction is relieved and no peristalsis results, the patient is going to die.

What I wish to caution against is doing too much to relieve post-operative obstruction. Put in a little catheter, fold it over the intestinal coats and let it go at that. But it is useless to do only this if there is a strangulation or a volvulus. The enterostomy alone will not cure the patient. But to the resection add an enterostomy on the oral side of the intestinal loop. That will not only relieve the bowel, but it will reduce the pressure. At the same time it will empty the segment of the intestine that has been enterostomized and so give rest to the muscular coat and permit the stitches to hold without tension.

Dr. John L. Jelks, Memphis, Tenn.—Every one who has done any bowel surgery has had some trouble. I had the misfortune of having two mortalities in a month in former days. I once asked Deaver, of Philadelphia, regarding these cases, "Why do you operate? Is there any chance?" And Deaver said, "No, there is no chance. They all die, but the family expect us to do something."

There is something wrong when they all die and my mortality has been infinitely greater than the essayist has given you. What is the trouble? The trouble is toxemia. Do not operate so much in these late cases for the obstruction as for the toxemia. The operation, then, is drainage. The first thing in the range of surgery is drainage. An ileostomy or a colostomy do no harm. It is a matter of a few minutes. Pick up and puncture the gut. Fix the tube in it by a purse-string suture. Roughen the edges of the serosa and suture the gut to the peritoneum and get out. Thus we have done no harm and have given the patient a chance to live. For not only drainage has been established, but also means wherewith to irrigate and free the intestine of vicious toxins.

After an abdominal operation you often find what appears to be an obstruction. You go back in and find a paretic ileus. It is no good to resect, for if you do you will have another. You had better perform an ileostomy and leave it. That is the opinion I have arisen to stress. The sympathetic nervous system must be taken into account. There is infinitely too much trauma by surgeons who go into abdomens in this country. They handle intestines as if they were cutaneous structures, with dry sponges.

The duodenal tube is one of the most valuable adjuvants. If you can get it in from above and let it stay there and a tube in the rectum and give the intestine rest and drainage, your patients may get well in some instances when they would certainly have died if they were subjected to any more trauma.

Dr. W. W. Grant, Denver, Colo.—There are two general classes of obstruction, mechanical and septic. The mortality is often due to the fact that these cases come to the surgeon when they are desperate, as in appendicitis. Mechanical obstruction is easily remediable when operated upon in time. It is preceded by several hours of violent peristalsis above the site of the obstruction. You may wash out the stomach and rectum as much as you please by gastric lavage, but this does not remove the difficulty. Relieve the obstruction within six to eight hours and the patient will get well. Every hour after that increases the mortality. Sepsis is another condition. Too frequently it exists before the patient reaches the surgeon.

If the surgeon operates when the condition is extreme and enterostomy is performed at the time of primary operation rather than after waiting we shall have better results. The deaths are due to septic peritonitis. To prevent it you must open the abdomen early and operate before the septic condition is so grave that not even enterostomy is of value.

Dr. Cowley S. Pettus, Little Rock, Ark.—The most important phase of this subject has been overlooked. Diagnosis of the condition has not been discussed. It matters not what the surgical procedure. If the diagnosis has been made before the patient becomes moribund, recovery in most instances can be truly promised. Therefore, diagnosis alone is the real safety zone offered to our patients who suffer with obstruction of the bowel.

The symptoms of obstruction are mostly obscure in the beginning and can not in any way be classified. I do not agree with Dr. Hendon in his statement that excruciating pain is a symptom. It is rarely the case that we have excruciating pain when the obstruction first occurs.

A case may continue for two or more days without any definable symptoms except nausea, slight vomiting and slight pain. The vomiting of a discolored fluid, though it has no odor, is always a suggestion. The pulse and temperature may continue normal for several days without any tympany. There is one thing about obstruction of the intestines, especially those cases following surgery of the abdomen. Seeing one case is of advantage to you in recognizing another such condition.

We are making such mistakes in diagnosing obstruction of the intestines as were made in diagnosing appendicitis twenty years ago.

Obstruction is one of the most important conditions that surgeons are confronted with. If a diagnosis is made early enough, removal of the obstruction is practically the only thing to do.

The presenting symptoms are vague and their recognition demands experience. In all abdominal involvements intestinal obstruction should be considered as a possibility.

Dr. Hendon (closing).—We are confronted with a curable condition and yet 50 per cent of its victims die. All that is necessary to right this wrong is to stimulate your interest and wake you up to a feeling of your responsibility.

The important thing in operating upon these cases is drainage of the alimentary canal. If you open the abdomen and release the obstruction, whatever it may be, and if the bowel does not collapse after you have released that obstruction, or if you do not see the fecal current pass beyond the site of obstruction, or if you see the bowel still distended above the obstruction, the patient will die. I shall not say every case, because you can not kill everybody. If these requirements are not met you may have released the obstruction, but you have not drained and have not met the most important and pressing demand of the situation. We know it is the absorption of toxins that kills. We can reduce the matter to "drain and save, absorb and kill."

One very important point is the diagnosis of post-operative obstruction. I interpret this to mean that which occurs during the patient's operative convalescence. I do not suppose you would consider the obstruction that occurs three to five years after operation as a post-operative obstruction. The most difficult thing I know of is to distinguish between mechanical obstruction following operation and adynamic ileus.

The reason the distinction is so important is that if you operate upon the patient with adynamic ileus it is fatal, and if you do not operate on those with mechanical obstruction it is fatal. If it is a mechanical obstruction you save their lives by operation, so it is very important to tell which it is. You certainly do not do any good to an adynamic ileus by an enterostomy.

My chief object in washing out the stomach is to get rid of the medicine that has been administered. I would not have Dr. Grant think for a minute that I expected to obtain any curative result from that procedure. It is a good means to keep your patient from becoming strangled on the operating table.

Dr. Pettus referred to the absence of pain. I can not conceive of an obstruction without pain.

SACRO-ILIAC SPRAIN*

By E. Denegre Martin, M.D., F.A.C.S.,
New Orleans, La.

An address before a body of surgeons on the subject of sacro-iliac sprains might call for an apology, but the term railway surgeon is in reality applied to a class and not a specialty. I am quite certain there are many here from remote rural districts, with limited opportunities of observation, who will welcome a discussion on this very common injury. Much has been written on sacro-iliac sprains, but from the literature at hand I have found little referring to the extensive and varied reflex pains accompanying this condition. From our large clinic we have been able to make a careful study of probably more than one hundred of these cases to which I shall later refer. Do not lose sight of the fact that many of these patients fall into the hands of the general practitioner, frequently getting well in spite of medication or running along in a chronic state before reaching a surgeon. Even to the more experienced the diagnosis is often puzzling.

Recently my attention was called to another side of this question, the railway side, a side that we as railway surgeons are called upon to protect.

Two suits are now pending against a railway of the South for supposed sacro-iliac strains in which neither the history nor the symptoms bear out the contentions.

There are probably among us those who may recall Erichson's railway spine, a pseudo-neurosis, having its origin in trauma of the spine, but exceedingly rare except in railway accidents. For years the roads were fleeced out of thousands of dollars until some of the frauds perpetrated were so palpable that Erichson himself realized that these symptoms originated in the minds of the injured. Most of the literature on the subject was furnished from court proceedings. Changes found at autopsies, rare indeed, could easily be accounted for by other causes. Probably the most famous case of this character was that of Nutting vs. the New Orleans Railway and Light Company, in which suit was brought for one hundred and five thousand dollars for a slight injury received while riding in a street car and causing, according to Nutting and his physicians, complete paralysis of the lower limbs. For more than a year Nutting lay upon his back, unable to move. The suit lasted ten days and resulted in a mistrial. Rather than go to court again the railway company compromised for a small amount and two weeks later Nutting was enjoying daily walks at Atlantic City.

It is not my purpose to enter fully into a description of sacro-iliac injuries, as the severe types due to childbirth or direct trauma are, as a rule, easily recognizable, but to dwell more especially upon the referred pains due to nerve involvement and which in my opinion are more frequent than is generally believed. Sacro-iliac sprains, I am confident, were not always recognized in the remote past and were probably more common than was generally supposed. Their frequency today is due not only to a better knowledge of the injury and consequently a proper diagnosis, but also to the great increase in the industries of the world.

It is now known that the sacro-iliac joint is not fixed, but is in reality a movable joint, and I agree with Baer that the term synchondrosis is a misnomer. Whereas the movement of the joint is limited by the sacro-iliac ligaments, nevertheless there is sufficient mobility to give a certain impetus to any sudden movement or severe strain at this point. If it were ankylosed, any force causing injury to the joint would have to be sufficient to break the union before throwing the strain on the ligaments and the condition known as the sacro-iliac sprain would be rare. The amount of mobility is greatest no doubt at the time of parturition, as the force exerted is great, but the strain on the ligaments is very gradual and a greater relaxation may exist without rupture of the ligaments. For

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this reason few cases are seen following normal delivery.

For our purpose today we must needs consider but two factors in the etiology of this injury: trauma, direct and indirect. In direct trauma the injury, as a rule, is localized and severe enough to be immediately recognized. Indirect trauma is the cause of 90 per cent of these cases and is due to muscle strain caused by the act of the patient in attempting to lift heavy loads when the pelvis is fixed and the ligaments tense. Laborers and athletes are prone to this injury. The symptomatology of sacro-iliac strain varies according to the factors producing it and the extent of the injury and the reflex pain is often misleading. To understand better the reflex pains of sacro-iliac sprain or strain we should remember the close relations of the sciatic nerve to the joint and the distribution of its branches to the integument and muscles of the back, thigh and legs.

As my associates see most of these cases in our clinic, I feel that I can not do better than quote one of them, Dr. W. P. Bradburn, who is especially interested in this phase of the work and whose information is derived from a large and varied experience. Sacro-iliac sprains or strains, he says, are best divided into three heads: first, that of pain in the joint itself; that of muscular pain, which, roughly speaking, may be said to be only above the level of the sacro-iliac joint; and the nerve referred pains which are usually below. In the more common types of sacro-iliac conditions encountered, the statements are rather characteristic. It hurts to stoop over, to put on the shoe. Turning over in bed is painful, or getting up or sitting down produces the discomfort referred to the sacro-iliac region. Palpation along the sacro-iliac joint on either side is rather painful, especially if the condition is one of recent occurrence. Bending forward, bending backward or to either side localizes the pain in this region. If the condition be simply one of unilateral strain, bearing toward the affected side produces the pain, while bending away from that side produces little if any discomfort. Again, the point of tenderness instead of being spread over the entire length of the sacro-iliac articulation may be localized to the upper middle or the lower surface of the bones on either or both sides of the articulation.

The type above referred to, namely, that of localized pain at or about the sacro-iliac joint, is readily diagnosed. The muscular pain, as previously mentioned, is generally above the sacro-iliac joint in the lumbar region just above the ilia, or, as not infrequently occurs, transmitted further up between the scapulæ and in some few cases even to the neck. It is this type of referred pain from the sacro-iliac joint which is often confused with lumbago. We should bear the possibility of the sacro-iliac sprain in mind whenever the patient complains of pain in this region, especially if it is associated with a history of trauma.

The nerve referred pain from the sacro-iliac sprain is really the most interesting group and most neglected from a diagnostic standpoint. It may be either referred locally or diffused over the area supplied by the ileo-inguinal and ileo-hypergastric nerves. The pain may be constant in character, being of the nerve type, or may be intermittent. On the right side particularly, it may at times be confused with a chronic appendix, but it is usually differentiated by the entire absence of other accompanying symptoms of chronic appendicitis and by a carefully taken history. Again, the pain may be referred to the testes, and in our series we have encountered this about five times. The pain here may be of the same character as above and may radiate from the back downward and may, momentarily, be confused with a renal calculus, particularly if of the acute, severe and intermittent type. Another characteristic region is the inner portion of the thigh. Still another distinct and almost diagnostic pain is that which is complained of as sharp, knife-like in character and localized at a spot as big as a half dollar a little below the level of the greater trochanter, about one and one-half to two inches posteriorly. Again, it may be referred directly down the course of the sciatic or along the tibials, or, as in an aggravated case recently seen, no pain whatsoever may be present in the

sacro-iliac region, but a burning and intense pain in the toes.

A few cases to illustrate may be of value to impress the points.

A patient sought relief at one of the local hospitals complaining of intense pain in the posterior portion of his thigh radiating towards the foot. No pain elsewhere. He was put to bed, morphin used freely, but no relief. Careful history of this man showed that several days previously he had miscalculated his distance when going down the steps and had felt at that time a slight pain in his back, but had forgotten it entirely when this intense pain began. A thorough strapping of his pelvis gave him more relief than the morphin previously used and in a few days he was completely at ease.

Another patient complained of severe pain, intermittent in character and distributed over the region of the left inguinal canal. Palpation revealed a slightly sensitive point at the upper portion of the left sacro-iliac articulation and strapping of the pelvis again gave relief.

The third case, a woman, was delivered up country, forceps delivery being necessitated, and according to the patient's mother, after a pull of over an hour and a half with no success, the doctor in attendance stated that something felt as if it had given way. The child was born some half hour later, traction still being maintained with the forceps. Immediately following the delivery a numb sensation was encountered in both lower extremities which gradually passed off, but within twenty-four hours after delivery a violent pain occurred in the left foot and was constant for four weeks. The diagnosis of sacro-iliac strain was made and putting a leather strap about the pelvis gave relief. But the x-ray showed in this case not only a separation of the sacro-iliac articulation, but a rupture at the semphysis pubis with marked separation of the pubic bones.

While attempting to sit in a chair a patient felt a sudden pain as if having sat on a pin. The pain became intense, but no evidence of external injury. Later the back began to pain and strapping again relieved.

I believe that it is these nerve pains referrable to a sacro-iliac that are often neglected. The patient's trouble is frequently diagnosed as sciatic neuralgia, muscular rheumatism, etc., and various liniments, massage and drugs are given, when the causative factor is sacro-iliac sprain, acute or chronic, and the essential thing is to find the cause, if possible. As to the x-ray findings it is our experience that in 90 per cent of the recent cases of sacro-iliac strain they are entirely negative. The diagnosis is better made on a carefully taken history and palpation of the joint. In the chronic sacro-iliac strains the x-ray can be of some assistance in showing the separation of the sacro-iliac joint and probably arthritic changes, but as an aid in the diagnosis of acute sacro-iliac the x-ray is of no value.

In the simple strains or sprains the treatment resolves inself into the proper strapping of the back in the acute cases and in the chronic or recurring cases a well-fitting sacro-iliac belt is needed. The buttocks should be compressed and adhesive strips three inches in width applied from one trochanter to the other opposite the third sacral segment. These straps should not go above the ilium. The strapping is frequently uncomfortable on account of the pull on the skin on either end of the strip. This I find is easily overcome by fixing these ends with another adhesive strap brought around in front and covered with gauze to prevent adhesion to the abdominal wall. This counteracts the pulling effort on the skin and, if not too tight, adds much to the comfort of the patient.

DISCUSSION

Dr. T. H. Hancock, Atlanta, Ga.—This is a paper that interests us deeply from the fact that there is no external evidence of the condition. Our late Chief Surgeon of the Central of Georgia Railroad, Dr. W. W. Owen, was very skeptical about it, until one day in lifting his brother, who was ill, he strained his own sacro-iliac joint, and suffered with it terribly until the time of his death.

Last week I had a tramp who had suffered a sprain of the ankle. An x-ray showed that a fragment had been torn loose from the end of the tibia. We have a great many of these sprains where we have no fracture of the bone, simply a tearing loose where the ligaments are attached to the bone.

The Doctor said that x-rays would not show anything in these cases, and that is an absolute fact. In one of my cases a lady had complete separation at the pubic joint and at the sacro-iliac. We put her in a plaster cast and she made a perfect recovery.

If a man has really a sacro-iliac dislocation he will submit to anesthetics. I am satisfied I have treated several people who had actual sacro-iliac trouble. Of course, most of them want the "greenback poultice." But if a man has real displacement of the sacro-iliac joint, and submits to the anesthetic, you can manipulate the legs in various positions and correct it, I believe, in many cases.

Dr. W. W. Harper, Selma, Ala.—As there are practically no objective symptoms of sprain of the sacro-iliac joint, the physician must rely upon the statement of the patient. When he complains of pain, how are we to differentiate between real pain and pain that is relieved only by "money plaster?" In closing the discussion,

will Dr. Martin tell us how to make a differential diagnosis?

Dr. J. A. Mitchell, Tullahoma, Tenn.—The Doctor spoke of finding the cause of the pain in sprained back. I noticed that he left out the teeth as a possible cause. I have seen cases where a pain across the lower part of the back was attributed to a strain in lifting or a wrench or twist of the back, or a very slight jar, and on examination have found the teeth in a poor condition. A correction of this trouble would relieve the pain.

Many of these cases complain of pain when pressure is made upon the posterior border and the external surface of one of the rami of the lower maxilla, just behind, underneath, or in front of the lobe of the ear.

A man who had a fracture of the clavicle, and had recovered from it, complained of a pain in the shoulder and down the arm on the injured side. When pressure was made on the maxilla, as above stated, he complained of a tenderness and pain. His teeth were in a bad condition.

Another case, a man 58 years old, had a severe neuralgic pain in the left shoulder and down the left arm about half way, which he thought was due to a strain. Removing a tooth cured this. He had had also an irregular heart for about twelve years, which then became regular.

Dr. J. M. Burke, Petersburg, Va.—I am satisfied that sacro-iliac dislocation has now practically taken the place of that famous old saw practiced for so many years upon corporations, and particularly railroads, known as the "railroad spine" and traumatic neurasthenia. Another thing is dislocation of the fifth lumbar vertebra. We all know how hard it is to get an x-ray picture of the fifth lumbar vertebra. We also know the impossibility or impracticability of getting an x-ray of a dislocation of the sacro-iliac joint. It resolves itself into this: I do not claim that there are no cases that are perfectly honest, but there are very few. But if you find that it is a corporation case you can mark it down that ninety-nine out of one hundred are troubled with one condition similar to traumatic neurasthenia. What is that? We are told that shock is a physical and mental impression. It is a mental impression with one idea: you can name it "moneyitis."

We had a case in the city of Savannah where a man was brought in on a stretcher. He was about seventy-five years of age. He had fallen down and he had a doctor and a shyster lawyer. They said: "This man cannot be examined." His reflexes were absolutely abolished, and the first-class doctor we employed said it was from the probable injury to that sacro-iliac joint. Pressure on the sciatic nerve and going on down gave no results. I went to the interne in the next room, secured a test tube and heated some water. While the doctor was talking and attracting his attention and the man was on a stretcher. I put this hot test tube against him and he pulled up his leg as well as anybody. A few days later the claim agent took a picture of him dangling his knees and walking around. There is your sacro-iliac joint. The thing that puzzles me is, how to find out if they have this condition, because ninety-nine out of a hundred have no trouble with the sacro-iliac.

Dr. Duncan Eve, Sr., Nashville, Tenn.—I do not think that all the cases are fakes, as Dr. Burke has suggested. I have seen many that were not railroad cases. I have followed them with their tremendous number of complications or what not, their extraordinary symptoms, for they are never the same. That is the trouble. We are told that pathology consists of a relaxation of the ligaments with synovitis of the sacro-iliac joint. Normally this articulation has some motion. When we have this stretching as the result of a sprain, which is a self-reduced dislocation, we have a latitude of motion that is abnormal, with all of the conditions of nervous complications and so on added.

I have followed these cases as closely as I have followed any cases in surgery. I am now glad to give them up to the orthopedists, glad to escape treating any case that smacks of a sacro-iliac injury.

Orthopedists are proposing many new methods for their relief, and so far as I know they have done nothing yet better than the general surgeon of today. Dr. Bradford, of Boston, has proposed a bone-graft and has reported several cases. Royal Whitman, of New York, is interested in this particular line of work, and we look for something good from him.

I wish to tell you of the exceptional cases, the case that nothing that you can possibly do seems to improve. Some of them are hysterical in a measure. They are necessarily so from the character and condition of their particular symptoms. Many of them have not so much the nervous conditions as they have pain in the joint.

Dr. John H. Blackburn, Bowling Green, Ky.—In a great many of these cases in relation to corporation surgery there is undoubtedly the element of malingering, or suggestion, or the mental attitude of the patient. When it comes to speaking of crutches, I recall very vividly the fact that I swore on oath that a man had a lesion of the cauda equina. A nerve specialist from Louisville gave as his opinion that it was a lesion of the cauda equina. When the thing was finally settled the claimant took the first train for Canada. He went to a shrine and prayed for a little while and threw his crutches away and came home cured in about three days.

I have recently had two cases, one of them my nurse anesthetist in France. In helping a patient three years ago from the operating table to the ward carriage, she said, "things gave way in her back." Since then she came back to the States, married, has borne a child, and has had definite trouble in that right sacro-iliac synchondrosis ever since.

Dr. Isidore Cohn, New Orleans, La.—In regard to the question of sacro-iliac dislocation, we are looking to our orthopedists for relief of pain. Why not go to our neurologists for the cause of this thing, looking directly to the etiologic factor, such as stretching of the nerve roots, then go to somebody for the relief of this stretching of nerve roots if it exists.

It is very interesting, in line with the "green-back" statement of Dr. Burke, to read the experiences of Dr. Arthur E. Hirst in his little book, "Medical Diseases of the War." It is remarkable

how many patients on the other side he cured by hypnotism.

It is interesting that no one has mentioned one thing in regard to this condition, regarding the strapping with orthopedic appliances. We sometimes lose sight of the fact that the sacrum acts as a sort of keystone between the two ilia, and rest in bed on the face will enable gravity to help us out along with strapping.

Dr. Martin (closing).—There are a great many people not familiar with this condition, who are apt to overlook it. We ought to be prepared for it. I did not go into the question of dislocation, which is a big subject. Dr. Hancock touched upon it. Dislocations can be reduced under anesthesia with the legs fully extended and flexed upon the abdomen.

It is a hard thing to speak of the pathology of this condition. We don't know it exactly. Let me give you a personal experience; then I think I can better illustrate what I wish to say.

Twelve years ago, when I was assisting in lifting a very heavy man from the table to the bed, his weight was thrown upon my back. I immediately felt something give way; I dropped to the floor and had a numb feeling in both legs. I do not know what happened. They put me upon the bed. I felt a tingling in my toes. In about an hour's time I was relieved of that sensation. My back was strapped, and in a few days, with the exception of a little soreness, I had no further trouble. About four years ago, while kneeling in front of the fireplace to shake the fire, I did not notice a piece of wood in front of the fireplace about two inches thick. I put my left knee on it and it threw the joint out again. That was much more painful than the first time. For a week I could scarcely get around. The last time was two years ago, when I was cranking an automobile. I was invalided for a week. I had none of the reflex pains. It was a loosening of the joint. Here is what I have concluded from that: that these conditions are curable. I believe most of them are. Of course, when the psychic element is involved you are dealing with a complication. As Dr. Foss said, many people have these troubles and continue to suffer, and are absolutely honest. I can not tell you what to do for these people, but I can tell you this: if you are dealing with an individual who is absolutely honest and wants to get well, I believe the large majority of them will get well with proper strapping of the back or a properly fitting bandage. That is the experience in our clinic. We have a large clinic, and we find that these people will get well, especially if they are not going to get any compensation. And even those that do, respond to the treatment.

When you find that you have these reflex conditions and they are not relieved by the proper strapping, you can make up your mind that it comes from the teeth or something else.

I have never had a case where the reflex pain went so far as the teeth. I have seen it go to the neck. I do not believe that condition has anything to do with it. That is what we must try to differentiate, between pains caused by other conditions and the sacro-iliac joint. Remember you can not injure that joint unless the pelvis is fixed. Usually when the pelvis is fixed you can cause the injury, but you can not do it by merely being thrown about. If that were so, think how many football players would suffer from sacro-iliac luxation. You must have a fixed joint, unless you have direct trauma. In those conditions, of course, it is easy to make the diagnosis.

There is something in the strapping. The minute you have it below the trochanter you can not walk. Stand the patient with his toes together, his hands behind his neck, get perfect relaxation, and put the straps on the back just in front of the trochanter. This gives almost immediate relief, but in a few days the straps begin to pull. You will find the best way to overcome that is to bring a piece in front around the abdomen, binding the ends and preventing slipping. That has given us more satisfaction than anything else.

The last patient I saw was in my office a few days ago. The man was crossing a ditch with a lady. His foot stuck as she was holding his arm and it gave a twist to his back. He felt nothing that day, just a little pain in the back. The case became aggravated. He had suffered a week when he came to me. I saw him again just before I left, still suffering. A little thing of that kind will cause it, but it takes a tremendous amount of trauma with a fixed pelvis to cause this dislocation. If you want to make a diagnosis, the history is absolutely necessary.

The two cases that I referred to as suing the road have no history of that kind. One was sitting in the car; he was not thrown from the seat. The car did not leave the track. He is getting worse all the time, but dislocation, I am confident, is mental.

EARLY DIAGNOSIS AND TREATMENT OF JOINT TUBERCULOSIS*

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This paper is not an attempt to introduce new methods of diagnosis and treatment, but to emphasize facts long known, hoping that they will reach the attention of the larger proportion of our confreres who are doing general practice and general surgery. Further, it is my desire to promote free discussion of the subject in order that we may have the benefit of the opinions of the many orthopedic surgeons present.

For a number of years I have been impressed with the haphazard methods employed for the diagnosis of early tuberculous joint lesions and the varying forms

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of treatment instituted. I have been equally impressed with the need for certain general rules of standardization for early diagnosis and especially for the adequate treatment of these cases. The responsibility for the functional end results in a vast majority of these cases of bone and joint tuberculosis rests with the medical man who sees them first, usually the general practitioner or the general surgeon. It is therefore of very great importance that these rules of standardization be called to the attention of the general profession as forcibly as those measures for the prevention of communicable diseases.

It is time for the fashion to disappear by which these conditions are diagnosed "growing pains," "rheumatism," "white swelling," "malaria," "curvature of the spine," "bad blood," "metastatic abscesses," "dislocated vertebrae" and many other such names equally foreign to the real pathology. And it is time for medical men generally to use easily obtainable diagnostic methods and come to a logical and accurate diagnosis, and institute treatment when it will benefit the patient most. In other words, the patient's welfare must not be sacrificed for the inattentive doctor.

When a suspected joint is presented for examination it is impossible for even the most experienced to make a diagnosis without investigation. It is too often the case that the investigation stops with an x-ray examination, whether it shows bone pathology or not. In going over the records of many joint cases in our clinics it was found that diagnoses of tuberculosis were made without evidence to prove their accuracy. It is important, therefore, that a standard for examination should be advocated constantly, and accuracy sought after. Such a standard is not elaborate, but is simply the routine, detailed examination.

A careful history is often disregarded. The inquiry, "Has any member of the patient's family had tuberculosis?" satisfies the questioner as to the possibility of exposure. It is of greater importance to inquire in regard to the occupants of the dwelling prior to the present family, and to make careful inquiry into the milk supply of the children. Especially is this true since it has recently been stated by competent authority that 10 per cent of all cows' milk in this country is infected with tuberculosis.

Loss of weight progressively, glandular enlargement, night cries, night sweats, the existence of afternoon temperature as shown by a two-hourly chart, are of the greatest value as diagnostic aids, yet are in the largest number of cases not brought out.

One takes for granted a very great deal if he thinks that because a fusiform swelling of a knee exists a tuberculous arthritis must be present, or that if an excess of fluid in a knee joint exists it necessarily rules out the existence of a tuberculous arthritis. Certainly the existence of infectious arthritis resulting from infected teeth, tonsils, genito-urinary tract and other pus pockets must be considered and cleared up before one can say the joint is or is not tuberculous. One can not be entirely sure even with an excellent x-ray whether tuberculosis or syphilis exists. Many of our radiologists claim that it is frequently impossible to differentiate these two.

The above remarks are no doubt commonplace and elementary, yet all of you have, almost daily, seen cases in advanced stages of destructive joint disease being treated for rheumatism, etc. Only recently I have seen caries of the cervical spine treated by a reputable gynecologist for rheumatism, while a woman with Pott's paraglegia was being beaten on the back with a hammer by a chiropractor at $5.00 a visit. This woman had seen fourteen physicians without a diagnosis. The responsibility for such conditions rests upon the shoulders of the physicians who see them early and do not make a correct diagnosis, and who treat them indifferently rather than refer them to a competent specialist.

Only recently the statement was made by a nationally prominent surgeon that it took a surgeon like Dr. J. B. Murphy to take the orthopedist out of the harness-maker class. A second surgeon, in addressing an audience said, "Ladies and gentlemen and orthopedists." But neither of them detailed the number of tubercu-

lous abscesses they had opened wide and allowed to become secondarily infected when they could not find the offending bone lesion. Nor did they offer an explanation for the frequent curetting of chronic sinuses by surgeons instead of opening the sinus and removing the diseased bone.

It is common practice for such poor surgical judgment to complicate a condition already serious. The blood picture, total white count and differential and temperature chart are often entirely ignored when such surgery is done. The trocar for draining dependent or otherwise troublesome tuberculous abscesses is a forgotten instrument, and if used, is not used intelligently.

The end results of tuberculous joint lesions, as I have been able to observe them in several parts of the country and especially in our own section of the South, are not indicative of the function for which we should strive. It has become fixed in the minds of many of us that the best that can be hoped for in such cases is ankylosis. This view is one that should be corrected, but such a correction can be brought about only if we all meet upon a common plan for the proper treatment of such cases. As the situation stands opinions differ widely, which prevents progress toward a perfect functional result.

All members of our profession must be brought to a full realization that a tuberculous joint is not a localized condition, but a constitutional disease: that it is not sufficient, after a diagnosis is made, to rest the part and apply extension in an indifferent manner until the pain has been relieved and the deformity to some extent reduced and resort to fixation alone. But that extension and freedom from weight bearing should be maintained over a long period of time, certainly not less than two years; that placing the patient in the proper hygienic environment, increasing the general resistance by forced feeding, heliotropy, both local and over the entire body, are as important as local treatment.

We have in our Southern states a climate particularly favorable for the use of heliotherapy. In the city of New Orleans ideal conditions exist for such treatment over a maximum period of time, a longer period of time than any point south or north, even within the boundaries of the State. The following records from the United States Weather Bureau support this claim:

"Normal mean temperature for the average year, 69.2° F. The percentage of all possible sunshine is 57 per cent, that is, over one-half of the sunshine it is possible to get, is always with us. The onset of our cold weather, which is never severe, is very late. The onset of weather below 65° F. is not until November 2, and weather below this average lasts only until March 28. In other words, there are five months only in which the weather is ever below 65° F. and many days in these five months the weather is above 65° F. and only once or twice in the year reaches near the freezing point."

It would therefore be possible to keep sick children in the open, sunshiny air practically 95 per cent of the daylight hours. The mild climate permits sleeping out of doors at night also.

We should be encouraged in striving for a better, if not a perfect, functional result by following the lead of Rollier of Switzerland; Calve of France; Sir Robert Jones of England; Freiberg and Campbell of the South; and Bradford and Lovett of Boston.

SUMMARY

(1.) It is my belief that sufficient care is not taken in making a diagnosis in the average case of early joint tuberculosis.

(2.) That the average general practitioner and general surgeon is not fully awake to the importance of early and accurate diagnosis and treatment in such cases nor are they fully conscious of their responsibility as related to the functional end result.

(3.) That the treatment of joint tuberculosis requires not local treatment of the affected part alone, but rigid and long-continued constitutional treatment.

(4.) That protection and extension of tuberculous joints should last over a period not less than two years, especially as regards weight bearing.

(5.) That the promiscuous opening of tuberculous abscesses and haphazard curetting of sinuses is extremely bad surgery.

(6.) That the end result striven for

should not be ankylosis, but a functioning joint. And that it is unfair to hope for such a result if weight bearing is allowed upon an actively diseased bony structure.

DISCUSSION

Dr. Archer O'Reilly, St. Louis, Mo.—The general practitioner, especially, is very lax in making a diagnosis of tuberculosis of the joint. From our experience in the hospital in St. Louis "rheumatism" seems to be the favorite diagnosis. I trust that those who are doing orthopedic surgery will not make a diagnosis of "rheumatism." The general practitioner should be educated to think of tuberculosis or some other serious condition when he has a case of joint disease, and not give the patient some medicine and call it rheumatism until serious deformity develops.

With regard to opening sinuses, the general surgeon has been taught that an infection should be opened wide and freely drained. In a case of a tuberculous abscess the general practitioner, or surgeon, is prone to open wide the abscess, pack it, leave it that way, and then turn it over to the orthopedic surgeon later to heal.

Dr. Willis C. Campbell, Memphis, Tenn.—For many years I have been deeply interested in heliotherapy and have employed this measure as a routine in all cases of tuberculosis of bones and joints when possible. We realize that in many adults we must frequently resort to more radical measures, as we must consider the economical status of the case in question. Tuberculosis in any form should not be considered as a local process, but a general infection if a permanent cure is to be expected. We have employed heliotherapy in several hundred cases, and have concluded that the sun's rays undoubtedly have a definite action on the diseased process. However, a grave error may be committed by depending on heliotherapy alone. The same careful application of orthopedic appliances for the prevention of deformity and fixation is an absolute necessity, as in the past, only such apparatus must be constructed so as to allow insolation of the entire body, and not to the local diseased area, for the beneficial action of the active rays on the entire body, as evidenced by pigmentation, is the real curative agent. Dosage must be worked out on scientific lines for each individual case, which requires constant and painstaking surveillance on the part of the surgeon. In the South heliotherapy can be systematically given for at least nine months in the year and should be more universally employed.

Dr. F. W. Carruthers, Little Rock, Ark.—There is one point in reference to tuberculosis of joints which I should like to bring out. The essayists stated these joints should be protected from weight-bearing for at least two years. During a recent visit to Chicago with some orthopedic men when I was examining a patient with Potts disease one of them said to me: "What do you think about this case?"

"It looks as though he is well."

"How long would you keep this case up?" I said I would keep it up at least one year, if not two, after the symptoms had disappeared. This is the particular point in my mind: to relieve weight-bearing for one or two years after all symptoms have disappeared.

As to the question of diagnosis, the orthopedic surgeon is confronted with an important problem when the question of tuberculosis of joints comes up. The average surgeon says, "You orthopedists regard every arthritis as tuberculous." We know that tuberculosis must be ruled out, and in treating the case I carry out the orthopedic treatment and not the general surgical treatment.

In reference to heliotherapy, I impress upon my patients that in carrying out this treatment I want them to look the color of Mexicans, and that cannot be accomplished with sixty minutes exposure a day. If it does it will take longer than they want to live.

Dr. W. B. Owen, Louisville, Ky.—We realize the importance of careful examination and thorough records in attempting to make an early diagnosis. If we omit them, it is not because of ignorance. Probably there are two or three reasons. First, it is carelessness; second, probably laziness; and third, we are attempting or forced to treat a great many people; paying more attention to the volume of practice than to the individual case. Early diagnosis in any disease is very important.

Dr. Campbell has covered in a very elaborate and practical way the advantages of heliotherapy, with which we all firmly agree. Unfortunately there are too few sunshiny days. Many of the institutions are not so arranged that they can have the advantage of sunshine. While the patient is at home it is difficult to make the family and friends realize the importance of heliotherapy and give it properly.

There is another point in Dr. O'Ferrall's paper to which I desire to refer. All roentgenologists will tell you that the differentiation between tuberculous and luetic infection is that a tuberculous infection shows a localized atrophy and decrease in density, while a syphilitic infection shows an increased density and hypertrophy. That does not always apply, because in many early cases the x-ray findings will be negative, though you have the clinical symptoms of infectious arthritis.

Immobilization and general constitutional treatment should be instituted at once. The source and type of infection can be determined later.

When the x-ray findings are negative, depend upon your clinical symptoms.

Dr. Earl D. McBride, Oklahoma City, Okla.—The essayist expressed the hope in the beginning of his paper that general practitioners might reap some benefit from bringing out information regarding tuberculosis of the hip and other joints. Nowadays the medical profession is trying to educate the layman. Only a week ago I made a speech in a church regarding cancer during cancer week, and a short time before that we had tuberculosis week, and so on. But I have heard no one bringing out the subject of joint tuberculosis in Red Cross tuberculosis drives. It seems to me the orthopedic sections of the various medical societies over the country should get busy and take a hand in educating laymen regarding joint tuberculosis. A great many people are opposed to having the joints of their children immobilized.

They say these joints will become stiff. We should educate the laity and not depend upon individual lectures in our offices. If we do this we shall accomplish a great deal of good.

I was impressed with what I saw this summer while in France. All of you who have been there know how thoroughly the people submit to treatment. They use heliotherapy very successfully, because patients go to be treated with the full expectation of doing exactly as they are asked to do. Patients are put flat upon their backs for a certain period of time. They are not kept in bed. They are given a donkey and cart and drive over the plains and seashore sands. Spitzy in his Vienna clinic had 150 cases, mostly children, on his sun roof. If the lesion is in the spine or below the twelfth dorsal, he strings them up by the feet. If the lesion is in the cervical region or down as far as the twelfth dorsal, he strings them up by the head and lowers the feet. They submitted to that treatment without trouble, and looked not only like Mexicans, but sometimes like Negroes. They were black. He is getting very good results from his treatment.

We should as an orthopedic section begin to show our influence in educating laymen in regard to the diagnosis and early treatment of tuberculous joint lesions.

Dr. Edward S. Hatch, New Orleans, La.—It is strictly the duty of men all over the country who are doing bone and joint surgery to educate not only the doctors, but the laity in reference to this line of work. Too much can not be said on this very point. We get these cases when the golden opportunity for securing good results has been lost, simply because a wrong diagnosis was made or inadequate treatment given after diagnosis. We should spread this propaganda at every possible opportunity, because it is our duty to teach people as well as doctors that these cases can be helped and that the joints can be made to function infinitely better than they have done in the past.

Dr. O'Ferrall (closing).—One of the first things we should attempt is to get together on our own methods of treatment. While I believe thoroughly in the education of the laity, the general practitioner and general surgeon, this is our first step. Methods among orthopedic men differ widely. If I, for instance, say that a child that has a tuberculous joint must be given rest and freedom from weight-bearing for two years or longer, if the parents have not been educated, they are going to object unless I am supported by other orthopedists. If that is the incorrect thing to do, it discredits me. If I should see a patient in my city, and you should differ with me in regard to treatment we have not gained anything. The first thing is to get together on a recognized treatment and support each other in that treatment. We may lose a few dollars by it in the beginning. If I make an effort to put a child at rest for two years and the parents refuse to have it done, they may take the child to another man. He may put on a plaster spica, and charges a fancy fee. He has made some money and I have lost it, but the most important thing is that the child has been permanently damaged. Unless we can get together on a recognized treatment we can not accomplish much with the laity.

TYPES OF INJURIES MET BY THE RAILROAD SURGEON*

By Jno. H. Blackburn, M.D., F.A.C.S.,
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In reviewing the cases seen within the last year as a result of railway accidents, we have been impressed with the predominance of certain characteristics of the injuries in general as well as by the varying types of injuries that have been encountered.

In considering injuries received on any public carrier we should, of course, bear in mind the injured, whether he be an employe, a passenger or "other person." Recent reports of the Interstate Commerce Commission show that "other persons" outnumber in injuries and in fatalities both passengers and employes, and it is further shown that over 85 per cent of the other persons are trespassers, so called. In our own experience the severe injuries and the fatalities were found almost entirely in those classed as a rule as trespassers, there being one fatality in an employe who was riding as a passenger. In jumping from a rapidly moving train he received such injuries to the skull that he died in convulsions and coma within three hours.

The injuries received by the employes were as a rule comparatively slight, although there were several who received multiple wounds. In all cases seen in passengers the wounds were classed as slight or moderate in severity. In the matter of the final adjustment of any claim for injury the relation of the injured to the carrier as well as his mental attitude regarding the nature, extent and severity of his injuries are factors that enter in a large measure and must be given due consideration.

As to the characteristics of the wounds in general, the most striking was the relatively large number who received multiple injuries. One of the employes had nine

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contusions and lacerations that could be seen within an hour after his injury and within a day or two showed some three or four additional areas of discoloration. In fact, it has been rather unusual to find a single injury, particularly in employes. Another rather striking feature has been the relatively large number of lacerated wounds encountered, but this is the rule with industrial surgery in general and especially in railway surgery.

Another outstanding feature of these cases has been the comparatively marked degree of shock, both primary and secondary, that has been encountered. Without entering into a discussion as to what shock is, we feel sure that the psychic element with the usual attendant surroundings of a railway accident is a large factor in the production of the so-called primary shock. In the cases of secondary shock usually found in more severe injuries, especially of the crushing type, and with large masses of contused or lacerated muscular tissue, there is no doubt that the hemorrhage and absorption of toxic material are more direct factors in its causation. It has obviously been noted that the shock has been somewhat greater in the cases of multiple injuries.

TYPES OF INJURIES

There were observed in our series of cases burns, sprains, contusions, abrasions, lacerations, incised wounds, punctured wounds, simple and compound fractures, concussion of the brain, compression of the brain, traumatic amputation of both legs, gunshot wound of hand, and severe abdominal wound. These different types of wounds have repeatedly been found in varying number in the same case. The lacerated and contused wounds were found most frequently on the extremities, hands and feet particularly, although they were distributed over practically the entire body. The fractures were found most often in the hands and arms, but were also found in the legs, skull and ilium. The ordinary wounds as mentioned above were found in their distribution and characteristics to conform rather closely to the rule of such injuries in industrial or traumatic surgery.

In order to illustrate the unusual or extraordinary features of certain of the cases as related to railway surgery we shall present brief reports of some of those which came under our observation.

Case 1.—James M., white, male, age 33. During his boyhood he had some trouble with the right hip which was followed by a discharge for a long time. At the age of 15 he had "white swelling" of the right knee with stiffness of the knee and wasting of the leg. While walking on a double track he stepped from one track to the other to allow a train approaching from the front to pass him. He was then struck from the rear by a train from the opposite direction and knocked off the track to the right of way. There were several contusions of the body, a fracture of the lower extremity of the left radius and a fracture of the right tibia and fibula in the middle third. An examination showed a number of scars about the hip and down the thigh to the knee, with contracted scars in the popliteal space. He stated that all of these were of several years' duration and that he had had no discharge from any one of the sinuses for a number of years. There was complete ankylosis of the right knee with marked atrophy of the muscles of the leg and about two inches shortening of the leg which necessitated his walking with a cane. An x-ray examination on the second day showed a transverse fracture of the tibia with a separation of a fragment on the crest, and an oblique of the fibula with a good approximation of the fragments. It also revealed the fact that there had been an atrophy or probably a failure of development of the bones.

The claimant suffered quite a great deal with the leg and complained considerably with the other injuries, contusions and sprains of the shoulder and back. He jumped out of bed one night and hurt his leg, and a later x-ray showed a less favorable approximation of the fragments and a very slow deposition of callus. However, he later began to use crutches and put some weight on the leg and finally got a fairly satisfactory union in a leg that had been crippled for about twenty-five years. In this case we watched with a great deal of interest the reparative process in a bone that had failed to develop because of lack of use as well as from the disease above.

Case 2.—Mrs. B., white, female, age 23. Fell in the aisle of the coach as the train stopped at the station. She had a very slight laceration and contusion of the right occipito-parietal region. She was an exceedingly frail woman, very small of stature, and on investigation we found that she had been operated upon five and a half months previously for ulcer of the stomach. The surgeon told her that he had "cut out twenty-three ulcers from her stomach," and she stated that she had not been well following the operation. In fact, she had been losing flesh ever since. We found that she measured 58½

inches in high heels and weighed 58 pounds. There was extreme emaciation and general prostration and she had a distinct muscular tremor over the entire body with marked shortness of breath on least exertion. The interesting feature of this case was not the slight laceration she sustained, but the strikingly small physique of the woman and the fact that she had attempted a 300-mile journey by rail in the day coach and continued on a 30-mile auto trip over fairly rough roads in this condition.

Case 3.—M. S., white, male, age 19. In attempting to catch a freight train in the yards he ran against a switch stand and had a compound fracture of the right tibia and fibula at the junction of the upper and middle thirds with marked laceration of the muscles of the leg. There were marked evidences of shock when he was brought in the hospital about an hour after the injury. This condition gradually increased in spite of every effort to revive him. On the second day he developed gangrene of the leg, but his condition never justified an attempt to do the amputation that was urgently indicated and he died the following day. The outstanding feature of this case was the fact that he was almost pulseless during the entire period following his injury. The evidences of profound shock existed during all this time, and there was absolutely no response to any or all of the measures resorted to.

Case 4.—W. E. J., black, male, age 35. In attempting to swing a freight train in the yards he slipped and his feet were caught under the wheels. He had a traumatic amputation of the left leg in the upper third with a fracture of the femur three inches above the knee joint. There was also a traumatic amputation of the right leg just above the middle. He also had a severe laceration of the right parietal region. When first seen he was in profound shock, pulseless, cold, with clammy perspiration over the entire body, air hunger and extreme thirst. There was no hemorrhage at this time. After tying the larger vessels and trimming the wounds somewhat, sterile dressings were applied and he was placed in bed and an attempt was made to revive him, but there was no response and he died in shock four hours after the receipt of the injury.

Case 5.—L. H., white, male, age 22. He was an employe who was riding into town on a local passenger train. In order to save time he got off the train before it reached the station and was thrown violently to the ground. His head and face struck the rail and tie of the sidetrack and he sustained severe lacerations of the forehead, cheeks and chin with fracture of the nasal bones and right frontal. When first seen twenty minutes after the accident he was unconscious and was having generalized convulsive seizures beginning about the head and upper extremities and quickly passing over the entire body. These seizures recurred at intervals of four to five minutes. He was removed to the hospital at once, but never regained consciousness and died within three hours after being injured.

These last two cases were not unusual in railway surgery except as exemplifying the wide diversity in the character and location of wounds of the more severe type and the ordinary hopelessness of such conditions so far as treatment is concerned

Case 6.—There had been a wreck on a two-span bridge with damage to one span. This was cut away from the other span and two blasts of explosives were placed at the pier to throw the span into the river. There were a large number of spectators present to witness the destruction of the bridge.

J. C., white, male, age 58, was standing near a large number of people when the two charges exploded. A missile, a part of a large washer, was thrown into the crowd of people and struck J. C. in the back of the head, tearing away almost the entire occipital bone and portions of both parietals, tearing out one hemisphere of the cerebrum and causing instant death.

G. S., white, male, age 26, was standing near. The missile was deflected after striking J. C. in the head and struck G. S. in the right half of the abdomen. He was immediately removed to the hospital. It was found that the missile struck him just right of the umbilicus, tearing away a portion of the skin three by five inches. There was a laceration of the anterior rectus and external oblique fascia, with a laceration of the rectus and oblique muscles. There was found a laceration of the caput ceci, a rupture of the right kidney and a fracture of the wing of the ilium with the separation of a fragment some two by three inches. The missile passed from before backward between the abdomen and the right arm and the explosive force was sufficient to fracture the ulna in two places and the radius at the middle without producing any external evidences except a slight laceration on the anterior surface of the wrist. He was given saline solution intravenously and by hypodermoclysis, and within sixteen hours a transfusion of 500 c. c. by the citrate method. Heat, opiates, cardiac stimulants and all ordinary measures were employed, but he died in shock sixty hours after the injury.

In these last two cases the unusual feature was the manner in which the wounds were inflicted, and since we happened to be an eye witness of the tragedy, the scene recalled vividly to mind some of those witnessed some three years ago

Case 7.—C. G., white, male, age 53. He was private policeman at the local station. In attempting to arrest and search four negro hoboes at 1 a. m. he accidentally discharged his pistol and inflicted a lacerated wound of the left hand, dorsal surface, over the metacarpal and first

phalanx of the index finger. This case is cited as indicating one of the unusual types of wound encountered by the railway surgeon in this line of his work.

1119 *State St.*

DISCUSSION

Dr. Duncan Eve, Nashville, Tenn.—We should remember that saline transfusion and hypodermics of strychnia are certainly indicated in many of these cases.

Dr. E. Denegre Martin, New Orleans, La.—I should like to ask the condition in which the patients reach the Doctor. It is important in the treatment following those cases, whether they were infected at that time and what means had been adopted to prevent infection.

Dr. Isidore Cohn, New Orleans, La.—There are two very interesting things about Dr. Blackburn's paper. Being such a good friend of Dr. Blackburn, I do not mind fussing with him about his having said that his patients had sprains. A good many years ago two men working in Philadelphia, Ross and Stewart, called attention to the fact that they did not believe in the existence of such an entity as a sprain, and that if we took enough x-ray pictures from enough different angles we should probably find in every instance a fracture. Small though it may be, its existence could be proven because of the fact that the ligaments about the joints have greater tensile strength than the small bony prominences to which they are attached.

In my experience, which is not railway experience, but experience based upon twelve years in a rather large clinic in the City of New Orleans, we have seen from twelve to fifteen hundred fractures. We see one hundred fractures to about five sprains, and we make a diagnosis of sprains because we can not find anything else. These cases, I believe, are not sprains in the old sense of strain or laceration of the ligament.

Dr. Blackburn spoke of the slow deposition of callus. It is very easy for us to say that callus has not been deposited in the proper time if we do not keep in mind one important fact: that cartilage is present in all human callus as well as animal callus. Cartilage does not show in the picture. Therefore we are often fooled by the apparent slow deposition of callus when there is really a deposition of cartilaginous bone.

Dr. Blackburn (closing).—These so-called sprains of the ankle we diagnosed as sprains because, with the x-rays at hand, which in each case we made in both the anterior-posterior and lateral positions, we were unable to find any evidence of fracture.

Probably we have slow ossification of the callus rather than slow deposition of the callus. This man had what, for some months, we called poor union. There was a fair maintenance of the approximation that he had after getting out of bed in the middle of the night to pick the baby off the floor. The condition then probably was slow ossification of the callus rather than slow deposition of the callus.

EYE, EAR, NOSE AND THROAT

DIPHTHERIA AND HEMOLYTIC STREPTOCOCCUS CARRIERS AS SHOWN BY TONSIL SECTIONS AND GROWTH AFTER ENUCLEATION*

BY GEO. E. ADKINS, M.D.,
Jackson, Miss.

Diphtheria carriers has been a subject of more or less interest since about 1900. The first report on carriers, as far as I have been able to find, was made in about 1902. These reports have occurred in rapid succession since that time, giving the percentage of carriers over the country as anywhere from 3 to 39 per cent.

These reports are inaccurate, for several reasons. Some of them were made of schools and included, of course, children who were eligible to school. Some of them were made with reference to location (as comparing some special part of a city to another). Some of them were made in the Army and Navy, and were limited usually to good physical risks who were eligible to Government service.

There have been very good reports from contagious disease hospitals, but they hardly do justice to a community or state at large, for those who report to a hospital of this character have some good reason to suspect that they are carriers, or have some other pathological condition that might make them more susceptible.

I object to these reports, as well as all others that I have been able to find in the literature, mainly for the reason that they deal with the conditions wholly from swabs made from the throat and cultured.

Swabs taken by an experienced hand (and I mean by this one who with the use of a head mirror, or some good lighting system, and the use of a tongue depressor and nasal speculum, gets well into the tonsil crypts, or well up into the nasopharynx, or in close proximity to the orifice of the nasal accessory sinuses) are not more than 60 per cent efficient. They are not over 40 per cent efficient when taken by one who uses the ordinary method of opening the mouth and simply sweeping at the throat.

The length of time required for a case of diphtheria to become negative is so constant that it has actually been put down in a tabulated form. It has been shown that the average time for the one-swab examination to become negative is twenty-one days. The average time for the two-swab examination to become negative is thirty-four days, and the average time for a three-swab examination is given at forty-five days, counting from the first of the one, two or three negatives as the case may be.

On account of the possible inaccuracy of these reports owing to the inefficiency of swab cultures even when well taken, and owing to the condition under which the reports were made, it was decided to section and culture one tonsil from each of one hundred cases from whom we enucleated the tonsil with no reference as to age, sex, location or season. A history of whether the patient from whom the tonsils were removed had ever had diphtheria, or had had diphtheria in the family, was kept. If the history was positive, had antitoxin been used in either curative or immunizing doses?

When the first one hundred cases were finished it was found that we had not covered a period of twelve months, and as long as the investigation was to be made regardless of a season we continued it for the remainder of the year.

There were in all two hundred and forty cases. One tonsil was sectioned and cultured from each case, and out of the two hundred and forty cases, thirty gave a positive history. Out of this thirty we were able to reproduce the infection in twenty-three, or 76 2/7 per cent. All of these cases had been relieved from quarantine by the two-swab method.

Out of the two hundred and ten who gave a negative history (and I mean by

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Fifteenth Annual Meeting, Hot Springs, Ark., Nov. 14-17, 1921.

a negative history that the patient had neither had diphtheria nor been in a family with it, so far as could be learned) we were able to grow the infection in seventeen, or 8 1/10 per cent.

From this investigation, which I believe is a moderately accurate one, I conclude that 12½ per cent of all people with diseased throats, ulcerated noses or infected nasal accessory sinuses are diphtheria carriers regardless of their history, and that 76 2/7 per cent of all people with positive histories who have not been rid of their infection by some method other than antitoxin are carriers regardless of their swab examination.

In this series of cases there were two who had immunizing doses of antitoxin, and from both of them we grew the infection when the tonsils were enucleated, sectioned and cultured.

There was a man thirty-seven years of age, who gave a history of having had diphtheria when a seven-year-old boy, whose tonsils grew positive when removed. The tonsils were removed from this man's son and also grew positive to diphtheria. This child was not of school age, which leaves a strong probability that a case of diphtheria contracted by a seven-year-old boy was handed down to his son thirty years later. However, I can not substantiate this.

It has been shown that approximately 97 per cent of all carriers harbor a virulent strain of infection, regardless of Shick's test. There is evidently some underlying cause for the patient's not becoming toxic from his own infection in a much larger percentage of cases.

It is a well-known fact that the greatest barrier to the invasion of micro-organisms into the human system is a leucocystosis and this is very common to diphtheria carriers. In the course of diphtheria opsonins occur in the circulation, being detectable as early as the third or fourth day of the disease. They reach their highest point within the next ten or fifteen days, and then begin to decrease. The time when the opsonins in the blood reach their highest point about corresponds to the time when the largest number of patients would be pronounced free of diphtheria bacillus by the ordinary swab method.

The phagocytic power in the blood in diphtheria carriers is considerably increased. This increase in leucocytes plus the antibodies that are in the circulation has a great part in the protection of the carrier from his own toxins.

The question naturally suggests itself, why the same conditions that protect the carrier from toxins would not rid it of the infection. In spite of the protection against toxins, the bacillus will persist in most cases. This seems usually dependent upon some local condition which interferes with the suitable contact of the specific destructive agent to the micro-organism.

There seems to be some foreign or necrotic tissue covering an ulcer or lining the crypt of a tonsil on which the infection may rest in a dormant state unmolested by the phagocytic power of the blood. It is walled off from contact by a so-called pyogenic membrane which protects them from contact, the leucocytes becoming dead cells, or pus cells, before they can engross the bacillus.

Local conditions will result from secondary infections with abrasions and ulcers of the mucous membrane lining the nose and accessory sinuses. They may result from mechanical injuries, a foreign body with associated infections.

A number of diphtheria carriers have been reported as becoming free of the infection during or closely following an attack of acute tonsillitis. This is very probably due to a slough of the superficial area, allowing the active leucocytosis to come more directly in contact with the infection. Again, it is very common for a case of nasal diphtheria to clear up after the removal of a foreign body, the healing of an ulcer, or the draining of a nasal accessory sinus.

Only one of my cases has apparently continued to be a carrier after the tonsils and adenoids were removed.

When we began this investigation, I asked the physicians at the laboratory to notice closely all cases reported to them and see if any carriers had had complete tonsillectomies. They reported one case

of a carrier in a girl who had her tonsils removed two or three years previously. On investigation of this case, I found that stumps were left on both sides. There may have been other cases under their observation, but this was the only one reported to me.

It is said that at least three investigators have attempted by direct introduction of large numbers of diphtheria bacilli into the nasal passages to produce carriers in healthy cats, guinea pigs and rabbits. The bacillus rapidly disappeared and nothing corresponding to the carrier seen in human beings was observed. At least one investigator attempted to produce carriers in healthy human beings by introducing bacillus into the nose, but failed, and concluded that the carrier state depended upon a focus of diseased tissue.

It would seem from the investigation of all that the common practice of using gargles and sprays is a useless one in disinfecting carriers. There may be some therapeutic value, inasmuch as one might heal some ulcer or cleanse some necrotic area that would be the harboring place for the bacillus.

Special attention was given to carriers of hemolytic streptococcus. In all cases in which tonsillectomy was done with reference to myocardial changes we found this micro-organisms predominating.

A history was taken with reference to previous attacks of influenza and the percentage of carriers who gave a positive history was 69 per cent.

In the cases of myocardial changes either acute or chronic, with or without compensation, and in cases of hyperthyroidism dating back to a previous attack of influenza, the percentage was approximately 80 per cent.

It would seem from these findings that the hemolytic streptococcus is one of the chief offending micro-organisms that we have to consider with reference to heart changes and hyperthyroidisms that come as a result of focal infection. It should interest us quite as much as a diphtheria bacillus.

One of the most essential things in reducing the prevalence of diphtheria over the country would be the complete removal of tonsils and adenoids or the clearing away of points of chronic focal infection in the upper respiratory tract of all diphtheria carriers (or rather all those cases who give a positive history) regardless of an examination made by repeated swabs.

It is also my opinion that myocardial and nephritic conditions, as well as hyperthyroidisms, should be dealt with practically in the same manner; for it seems that they are dependent upon a focal infection in which the predominating or chief offender is the hemolytic streptococcus.

DISCUSSION

Dr. Carl A. Weiss, Baton Rouge, La.—It has always been a perplexing problem to me how to get rid of the infection in the throat, nose and nasopharynx of the carrier. Removal of the tonsils and adenoids may take away the source of infection, provided the tonsils and adenoids harbor the infection, but on the other hand, when you remove the adenoids and tonsils, you have opened up greater avenues of infection and subject the carrier to greater risks, and why is it that the patient does not have the actual lesion of diphtheria in the throat? You might say that he is naturally immune. That is true where you have an unbroken mucous surface, but why is it that after you have broken this mucous surface the infection does not spread along these avenues of lessened resistance?

I have recently had an experience with diphtheria that has set me to thinking. I had a patient 18 months old with membrane on both tonsils, high temperature and adenitis. Culture showed positive diphtheria. I gave this child 10,000 units of antitoxin and in four days it cleared up. I did not go any further. Two months after the child was brought into my office, and on looking down its throat I found both tonsils covered with membrane again. Croupons, dyspneic. A culture was positive. I could hardly believe that in two months' time, after 10,000 units, the child could have another infection of diphtheria. I gave it 30,000 units of antitoxin and then had twenty-four hours of anxious waiting before it was out of danger. It was a question with me whether that child still harbored the infection in the larynx, or whether there was a reinfection there.

Dr. J. A. Stucky, Lexington, Ky.—Why should we suspect that a patient is a diphtheria carrier unless there is an outbreak of diphtheria? I recently had a case which is of sufficient interest and rarity to report.

A trained nurse was referred to me for persistent headache. On examination we found suppurative ethmoiditis of the anterior cells. A culture from the middle meatus and from the tonsils showed a positive diphtheroid; Klebs-Loffler from the nose; streptococcus hemolyticus from the throat. The tonsils were removed, but the patient got no better. Another culture was made and we had three positives of diphtheroid and two negatives made in three of the leading laboratories in Kentucky. The State Board of Health said positively that while the culture showed a diphtheroid germ, it was not true diphtheria. In the University of Kentucky they made the same statement. The Board of Health in Lexington pronounced it positive Klebs-Loffler. I declined to operate upon the ethmoid, treated it by the usual mild antiseptic treatment, and in two or three weeks after the removal of the tonsils the patient was relieved of her headaches and the cultures were pronounced negative by all three laboratories.

Another interesting feature referred to by the last speaker was that we gave this woman 15,000 units of antitoxin, which I thought was enough in a case where we questioned the diagnosis. The question was whether she was a diphtheria carrier. We had a most exasperating antiphylaxis following the antitoxin. She had urticaria and fever, was miserable for three or four days and was unable to leave her room for a week.

When are we to suspect and why are we to suspect a diphtheria carrier when there is no diphtheria present? I never suspected anything of the kind in this patient. There was no diphtheria in our city. This woman was with school children most of her time and was shocked when she was isolated.

Has it been settled that there is a difference between the diphtheroid bacillus and the true diphtheria, the Klebs-Loffler?

Dr. William W. Potter, Knoxville, Tenn.—We must bear in mind that there are other modes of carrying this infection beside human. This possibly would be of interest to those of you who are farmers, who live in the country and know something about chickens. It has been determined by experimentation by Dr. William Litterer, of Nashville, that the ordinary roup among chickens is nothing more nor less than diphtheria. He was recently sent some smears by a physician in the country and he reported back immediately after making cultures that they showed positive diphtheria, Klebs-Loffler bacilli. The doctor wrote back, "This stuff came from chickens." This of course opened quite a field of thought. He took some chickens and infected them with this roup, then injected them with antitoxin, and in the course of a few hours they were all right again. They seemed to be half dead before they had the antitoxin.

Dr. H. W. Lyman, St. Louis, Mo.—In the Children's Hospital we have had several cases which microscopically and from smears and cultures seemed to be diphtheria whose report was positive Klebs-Loffler. Yet clinically these cases did not show any of the signs of diphtheria. During one series of cases inoculations were made in guinea pigs, with the usual fatal result. While it has not been worked out as yet, it seems that there is a bacillus which grows like the Klebs-Loffler. Still there is a variation in virulence sufficient to account for cases that show the Klebs-Loffler bacillus and do not show any clinical signs of the disease.

Dr. Adkins (closing).—I mentioned the fact that there is a high poly count in all diphtheria carriers that keeps up their resisting power, keeps them from taking the disease, acting as an antibody stored up in the blood.

Replying to Dr. Stucky, the diphtheria bacillus as we have found it will live on dead tissues, not on healthy tissue. The carriers all harbor some dead tissue with which the blood does not come in contact. I believe it would be impossible to infect perfectly healthy mucous membrane with diphtheria.

SOME EXPERIENCE WITH METAL PLATES IN THE ADVANCEMENT OF OCULAR MUSCLES*

By Adolph O. Pfingst, M.D., F.A.C.S., Louisville, Ky.

In 1918, my attention was called to the use of gold suture plates in the advancement of ocular muscles by my assistant, who had employed them while in service with Dr. Meyer Wiener, at Camp Greenleaf. As the greatest difficulty in all of the methods of advancement formerly employed in my practice seemed to lie in combining simplicity of technic with the ability to obtain firm anchorage of the distal sutures, the employment of metal plates at once appealed to me as meeting both requirements. I adopted their use and have since applied them in all of my advancement operations.

Before entering into the method of employing the plates I shall ask your indulgence while I review the development of the operation for squint from its inception up to the present time. The first time surgical treatment was employed in cases of squint was in 1839, when Diefenbach[1] and Jules Guerin,[2] independently of each other, divided the internal rectus muscle in cases of convergent strabismus, following the suggestion of Strohmeier,[3]

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who had done the operation upon the cadaver and had suggested its application to the living. As many of the early operations were followed by contraction of the antagonist of the divided muscle, causing thereby a backward displacement of the severed muscle and converting a convergent into a divergent squint, the operation for a time seemed doomed to fall into disrepute. With the perfection of instruments and their more careful employment it was found by von Graefe and others that by severing the muscle at its tendonous attachment to the sclera rather than by doing a myotomy such as was done by Diefenbach and other early operators, the amount of muscle retraction could be more readily graduated and consequently over-correction became less frequent.

In those days retraction of the divided muscle was increased or diminished by rotating the eye by means of conjunctival sutures in the direction of the severed muscle or away from it according as less or more effect was desired, and holding it for several days by fixing the threads to the face with adhesive plaster. It was the custom of the early operators to make a conjunctival section transversely to the long axis of the muscle and expose the muscle for an open operation. Later English surgeons, among them Critchett and Boroman, advised the entrance of squint hook and scissors through a small conjunctival opening made parallel to the long axis of the muscle and division of the tendon sub-conjunctivally.

Notwithstanding careful tenotomies, over effects were not always avoidable. It was also found that tenotomies alone did not always suffice to correct the squint, this being especially true of divergent squint. Owing to a frequent over-effect of complete tenotomy, partial tenotomies, either at the edges or in the middle of the muscle (buttonhole) were practiced, especially in this country, by such well known ophthalmic surgeons as Stephens, Savage and others. This operation has, on account of the uncertainty of results, practically fallen into disuse.

Ten years after the introduction of tenotomy for squint Guerin[4] conceived the idea that in those cases in which tenotomy was followed by an over-effect the divided muscle might be caught up again and made to take a forward position on the eyeball to reduce the effect of the tenotomy. He did this successfully by dissecting the retracted muscle from its surroundings, pulling it forward with forceps and holding the eyeball over in the direction of the desired effect with sutures plastered to the skin. Von Graefe increased the scope of the indications for this operation by employing it primarily on the weak muscle after tenotomizing it, so as to advance the attachment. He pulled the eyeball in the direction of the divided muscle by means of conjunctival sutures plastered to the face. The idea of suturing the muscle to the sclera originated with Critchett,[5] who advanced the muscle by passing sutures through it and then through the conjunctiva near the cornea, the eyeball being turned by drawing the suture ends together. Following this, many modifications of the advancement operation were made, some in the manner of passing the sutures through the muscle and others in the manner of passing them at the distal (corneal) end. As the operation for advancing ocular muscles became more popular and tenotomy was correspondingly less employed, the observation was made that tenotomies which set back the attachment of the muscle lessened the sphere of action without materially increasing the action of its opponent, whereas advancement of the weak muscle strengthened this muscle and increased its sphere of activity without lessening the activity of its antagonist. Credit for the development of the squint operation is due Landolt, who has done much to establish the principal of strengthening the weak muscle rather than weakening the strong one.

Effects similar to those produced by advancing a muscle were later obtained by folding the muscle and Tenon's capsule without severing the tendonous attachment to the sclera. This so-called folding or tucking operation which was introduced by deWecker[6] in 1893 was later perfected by American operators, among them Howe, Todd, Valk and others. The

operation was very popular some years ago and many modifications of the method as it was originally practiced by de-Wecker and also of the instruments employed in the operation were made by American surgeons. The operation was somewhat uncertain in its results, owing to the necessity of using absorbable suture material, and was practically always followed by an unsightly projection at the site of the fold which disappeared very slowly and sometimes even remained as a permanent disfigurement. Hence it is now employed by few operators. As a substitute for the advancement of ocular muscles, some surgeons advocate resection of the muscle either by cutting out a portion of the muscle and reattaching its cut ends by means of sutures, or by sewing one end of the severed muscle up higher on the other end, thereby overlapping the free ends of the muscle. There are now many advocates of the resection operation. The most simple and efficient of the various operations of resection is perhaps the one introduced by Reese, which is now being largely practiced in this country.

The chief objection offered to the resection operation is the fact that a portion of the muscle has to be sacrificed. In high degree squints it is quite a considerable portion. By some surgeons it is employed only in high degree squints as an adjunct to the advancement operation, a portion of the tendonous end of the muscle being removed before the muscle is advanced.

In an endeavor to solve the two chief problems of the advancement operation, i. e., the placing of the muscle suture without causing atrophy of a portion of the muscle and the introduction of the fixing sutures in the episcleral or scleral tissue so that they will hold, a great many modifications of the original operation have been introduced. Some muscle sutures included half the breadth of the muscle; some, one-third. But most of them necessitated tying of the suture around the included portion of the muscle. The distal stitches varied, some being drawn directly forward to the edge of the cornea, some extending above and below the cornea and some being placed parallel to the corneal margin (Verhoff). In placing these sutures some operators endeavored to penetrate the sclera, others the episcleral tissue, and some only the conjunctiva. Irrespective of the method employed, the threads, after being placed, sometimes cut through the tissue. This brought about an under-effect. This was especially true of the conjunctival sutures.

It would seem that the metal plates solve both problems. By placing a plate for the suture loop over the belly of the muscle a firm hold is given without tying off or choking a portion of the muscle. The distal plate over the conjunctiva distributes the pressure over a broad surface and thereby does away with the tendency of the threads to cut through the conjunctiva. Thus firm union may be secured without the necessity of anchoring the threads in the scleral or episcleral tissue.

The employment of plates has the further advantage of allowing the operator to regulate the amount of advancement by tightening or loosening the knot very much as is done in the pulley operation formerly employed by Prince and others. The simplicity with which the sutures can be removed is an advantage over all of the other sutures employed in the advancement operation.

Reference to literature reveals the fact that metal plates were first used in muscle advancement and muscle shortening by Dr. George H. Price, of Nashville, in 1895. Dr. Savage spoke of the plates in an editorial in the *Ophthalmic Record* in 1895.[7] I am indebted to him for a personal letter in which he writes that,

> "Price had seen something about a suture plate which had slits at each end into which the sutures were to be drawn and then the knot tied. He at once concluded that holes and not slits should be made in the plate. His first plates were made of aluminum, but in a little while he saw that silver plates would be better."

I have been unable to find any other reference to the use of metal plates or any description of the method of employing them until Meyer Wiener described

the use of gold plates in 1919. Credit should be given Wiener for a comprehensive description of the method of employing the plates. This can be found in the *Transactions of the Academy of Ophthalmology*.[8]

In brief it is as follows: vertical conjunctival incision ¾ mm. away from corneal margin; dissection of conjunctiva backward in order to expose field of operation; snipping of Tenon's capsule; introduction of two squint hooks under the tendon to put it on the stretch. Thread is double armed (Corticello black silk, size D) and the needles passed through the eyes of the plate and then through the conjunctival flap near its margin. It is then passed through the muscle tendon, the bite in the tendon being taken by passing the needle transversely from its center outward. One is passed upward and the other downward, emerging at the margin of the tendon. The tendon is then severed from its scleral attachment. The needles are then passed under that portion of the conjunctiva next to the cornea and are brought out near the edge of the cornea about 4 mm. apart and a second plate is introduced on the threads. By tying the threads the plates are approximated and the muscle is advanced, the amount being regulated by the amount of approximation of the plates, or, in other words, by the degree of tightening of the knot. The conjunctival edges approximate and do not need an additional suture.

I have employed suture plates in forty-three cases from my private practice and in upward of ten cases at my clinic at the University of Louisville. The forty-three cases from my private practice are represented as follows:

Convergent concomitant squint (original cases), 22 cases.

Convergent concomitant squint (in which former operation by some other surgeon had been unsuccessful), 8 cases.

Convergent alternating squint, 1 case.
Convergent paralytic squint, 1 case.

Divergent concomitant squint (original cases), 4 cases.

Divergent concomitant squint (in which opposing muscle had been tenotomized by some other surgeon), 3 cases.

Divergent concomitant squint (in which advancement by other surgeons had been unsuccessful), 2 cases.

Vertical squint, 2 cases.

The degree of deviation in the 22 original cases of convergent concomitant squint varied from 8 to 40 degrees.

In all of them optical correction and educative treatment had failed. In the cases with less than 20 degree deviation advancement of the external rectus of the deviating eye usually brought about binocular fixation. In three instances the result was insufficient and subsequent advancement of the external rectus of the fixing eye had to be done to bring about the desired result. In the cases with more than 20 degree deviation advancement of both external recti either done at the same time or several months apart (the squinting eye being operated upon first) was frequently necessary. In several cases of convergent squint with high degrees of hypermetropia in which the optical correction brought about considerable lessening of the squint, it has been my aim not to correct fully the abnormal convergence by surgical means, but to allow for the effect of the wearing of glasses to overcome the remaining uncorrected portion. Instances of this kind are shown in cases 8 and 15. In the convergent cases of low degree refractive error, not improved by wearing of glasses, a slight over-correction was always attempted. A permanent over-correction did not result in any of the cases in which advancement on either one or both eyes was done without a tenotomy of the internus.

In four of the cases, owing to high degree deviation with limited excursion of the eyes outward, a combined operation of tenotomy of the internal rectus and advancement of the external was done primarily. While the result was perfect in 3 of the cases, the outcome of the other case was anything but gratifying, the child developing a pronounced divergence with limited convergence (Case 3). In the 8 cases which had been

tenotomized unsuccessfully by other operators, 5 obtained binocular fixation by advancing the external rectus of the deviating eye. In one the advancement brought about only partial correction and the external rectus of the fixing eye had subsequently to be advanced. In 2 cases both external recti were advanced at the same time. In the only case of alternating convergent squint (Case 31) both externi were advanced with an apparent over-effect. A month after the operation examination revealed a remaining deviation of 6 degrees with no tendency to fusion.

In the single case of paralytic convergent strabismus, the eyes were apparently parallel for some months after the operation, but there has been a gradual return to convergence. The degree of squint has not reached the amount present before the operation (Case 32).

In the divergent cases it was my endeavor always to bring about a little over-correction, as these cases show a tendency to fall somewhat short of the anticipated result.

As the observation was made that in approximating the plates even in cases in which the sutures were placed quite close to the cornea, the small area of conjunctiva between the cornea and the point of the distal conjunctival suture opening stretched somewhat, the additional precaution was taken in those cases in which a maximum result was desired, to pass the distal sutures through the episcleral tissue before perforating the conjunctiva. This was done in all of the divergent cases and exceptionally in the convergent cases. This seemed to me to do away with that slight "give" of the sutures due to conjunctival stretching.

My divergent cases were all the result of adductor insufficiency. The primary cases all occurred in myopic eyes with a single exception in which there was present 1.5 D of hypermetropia (Case 33). All of the cases which had developed after tenotomy of the rectus internus occurred in hypermetropes. One of these cases had been operated upon four times and had apparently undergone tenotomy of both internal and advancement of both external recti. This was a difficult case, owing to the difficulty in finding muscle tissue. Notwithstanding advancement of both internal recti, there is still some divergence of the left eye (Case 40).

One of the cases of vertical squint was a true vertical deviation upward of the right eye with 14 degree deviation (Case 42). Advancement of the right inferior rectus reduced the squint just half. The patient was advised to have the superior rectus of the left eye advanced, but has so far not consented to the operation.

The other vertical case was one of right hyperphoria due to congenital weakness or absence of the right superior oblique (Case 43), in which a tenotomy of the right inferior oblique had been done elsewhere without improvement. This boy's eye rolled upward whenever he looked toward the left. Advancement of the right inferior rectus brought the eye down to a level with the other. It still turns inward when looking toward the left, but less pronouncedly than formerly.

Summarizing, I would say that the sutures held in all cases in which they were properly placed and tied. In the one instance in which the plates separated and the result was unsatisfactory the failure can be assigned to faulty technic. The thread broke off short while the suture was being tied. To impress upon you the firmness with which the sutures hold over the plates I wish to say that in my first four cases the operated eye alone was bandaged after the operation. This was done through a mistaken impression that Wiener treated his cases in this way. Notwithstanding that no restrictions were placed on the non-operated eyes, the sutures in these four cases held just as well as they did in the subsequent cases in which both eyes were bandaged for four days (Case 2). It has been my custom to remove the plates on the sixth day. In several instances, on account of an apparent over-effect of the operation,

it was deemed advisable to remove them on the fourth day.

The gold plates used by Wiener come in three-inch strips and can be cut from the strip as they are to be used. Originally designed by Wiener, they were 6 mm. long and 2 mm. wide. The ones used at present by Wiener are 1 mm. shorter than the original plates and measure 5 mm. I have some to show you sent me by A. S. Aloe Co., St. Louis, as Wiener plates, which seem too wide. The longer plates as originally designed by Wiener are best, since they allow the sutures to come through the holes in the plate more nearly at the point of conjunctival perforation than the shorter plates.

After my attention was called to the Price silver plates, I secured some of these from the Theo. Tafel Co., Nashville, Tenn., and have employed them in 3 cases. These plates are longer and wider than the Wiener gold plates, measuring 8 by 2.5 mm. and have rounded corners. They are so curved on the flat as to have a concave surface, presumably to adapt them to the curve of the eye. The perforations are larger and farther apart than in the gold plates.

While I have not used these plates in a sufficient number of cases to draw positive conclusions, I have gained the impression that they are approximated more easily than the Wiener plates. The thread seems to slide through the holes without sticking. In several of my cases in which the gold plates were used the thread seemed to hang. This necessitated rather a hard pull in approximating the plates which in several instances caused the thread to break and necessitated replacing of the sutures. In one case this happened three times. As the last knot seemed to hold, as the thread had broken close to the knot, the suture was left. It was this case (Case 7) in which the sutures were found loose and the plates separated when the eye was dressed on the second day. This resulted in an under-effect and the case was subjected to a second operation which was successful.

As I could see no advantage in the curve in the Price plates, I flattened them before using them. I might add that none of the three cases in which these large silver plates were used complained of any discomfort.

A black twisted silk thread (Corticello D) was used in all of my cases.

General anesthetic was employed but three times on account of nervousness of the patient. In the others, a preliminary hypodermic of morphia and atrophia (gr. 1/4 and 1/150 in adults and children in proportion) and 6 per cent cocain and adrenalin installations for 10 minutes prior to the operation were employed. The advantages of performing the operation under a local anesthetic are self-evident.

While a detailed description of all of my cases would be of no special interest, I shall add a brief report of a few selected cases which have unusual features.

Case 2.—Female, 26 years old, married; left eye crossed since two years old. Optical correction of refractive error has failed to lessen deviation.

Examination.—Left constant convergent concomitant squint 20 degree (Priestly-Smith).

Skiascopy.—Homatropia, R. 2.0 D. Hy., L. 2.0 D. Hy. Central fixation with left eye when right covered.

Vision.—With optical correction, R. 20/20, L. 20/30.

Operation.—Local anesthesia, advancement left external rectus. (Gold plates employed.) Operated eye dressed, right left uncovered. Plates removed on sixth day.

Result.—Binocular fixation.

Case 3.—Boy, age 11 years. Right eye crossed since 3 years old. Has worn correcting glasses for 3 years. No change in degree of squint.

Examination.—Right constant convergent concomitant squint of 35 degrees (Priestly-Smith).

Skiascopy.—(Under atropia cycloplegia). R. 2.5 H.; L. 1.5 D. H. Vision with optical correction, R. 20/100; L. 20/20. Central fixation with right eye when left eye closed.

Operation.—General anesthesia; advancement right external rectus (Wiener plates employed), tenotomy internus. Both eyes bandaged for four days. At first dressing over-correction noticed. Plates removed on fourth day. Gradual increase in divergence until now has divergence of 20 degrees. Advised advancement of right internal rectus.

Case 7.—Boy, age 8 years. Left convergence since birth. Optical correction of refractive error has failed to lessen degree of deviation.

Examination.—Left constant convergence 40 degrees (Priestly-Smith); excentric fixation with left eye when right is screened.

Skiascopy.—Atropia, R. 5.5 D. H.=1.5 D. C. 15°; L. 5.0 D. H.=1.0 D. C. 135°.

Vision with correction, R. 20/20; L. 20/200.

Operation.—Local anesthesia. Advancement left external (gold plates) and tenotomy internal rectus. Suture had to be introduced three times, as the thread caught in approximating plates and finally broke. Third time the thread broke at the knot and was not reapplied, as it seemed to hold the plates in apposition. At dressing two days later plates had separated somewhat as thread had slipped from plate. As a very slight result was obtained as a result of this faulty technic, the external rectus of the right eye was advanced two months later. Plates removed seventh day.

Result.—Without optical correction 8 degrees convergence. With correcting lenses eyes obviously straight.

Case 8.—Girl, 17 years old, single. Left eye crossed since first year. Has used correcting lenses with reduction of deviation.

Examination.—Left constant convergent concomitant squint of 40 degrees (Priestly-Smith). Excentric fixation with left eye when right is covered.

Retinoscopy under atropia: R. 3.0 D. H.= 0.5 D. C. 90°; L. 3.0 D. H.=1.0 D. C. 90°.

Vision.—R. 20/20; L. Fingers 1 foot (excentric). With correcting lenses deviation reduced to 25°.

Operation—Local anesthesia; left tenotomy internus; advancement externus (gold plates). The immediate effect in this case was a decided over-correction. Sutures on a gold plate were introduced in the retracted internal rectus and muscle was reattached by means of conjunctival suture to a point near its original insertion. Both eyes bandaged four days. Plates removed on sixth day.

Result.—Slight convergence, 6°; binocular fixation with correcting lenses.

Case 15.—Girl, 10 years old; right eye crossed since 2½ years old. Has worn glasses for two years with some improvement. Central fixation with right eye when left is covered.

Examination.—R. constant convergent concomitant squint, 40 degrees (Priestly-Smith).

Retinoscopy under atropia; right and left 6 D. H.

Vision with correction, right and left 20/20. Deviation reduced to 20 degrees with correction.

Operation.—Local anesthesia; advancement right externus (Wiener plates) tenotomy internus. After approximation of plates right eye was still slightly deviated inward. Both eyes covered for four days. Plates removed on sixth day.

Result.—Convergence of 10 degrees. With optical correction eyes were parallel with mirror test.

Case 31.—Female, 22 years old, married; both eyes crossed since birth. Has worn glasses without result.

Examination.—Alternating convergent strabismus, 19 degrees (Priestly-Smith).

Skiascopy Under Atropia.—R. 1.0 D. H.; L. 1.5 D. H. with 0.5 astigmatism.

Vision with correction, right and left 20/20.

Operation.—Advancement right; two months later left, external rectus.

Result.—No tendency to binocular fixation. Converges almost constantly with right eye; deviation 8 degrees. Tenotomy right internal rectus advised.

Case 32.—Male, 24 years old, married. History of squint, left eye since a year old. Has tried glasses with no improvement.

Examination.—L. paralytic convergence 12 degrees (Priestly-Smith); inability to rotate left eye outward beyond median line.

Retinoscopy Under Homatropia.—R. 1.0 D H.; L. 0.5 D. H.

Vision.—Right and left, 20/15.

Operation.—Local anesthesia; advancement left external rectus (gold plates). Upon completion of operation muscles apparently balanced. Both eyes bandaged for four days. Plates removed on seventh day. Three months later there was a very slight manifest convergence, 4 degrees (Priestly-Smith).

Case 33.—Female, 26 years old, single. History of left eye divergent since birth. Was given glasses by optician, 0.75 D, with increase in discomfort.

Examination.—Right, constant divergent concomitant squint, 3 degrees (Priestly-Smith); insufficiency of adduction. Prismatic test not possible on account of suppression of images.

Retinoscopy Under Homatropia.—Right and left, 1.5 D. Hy.

Vision.—Right and left, 20/20.

Operation.—Local anesthesia; advancement right internal rectus; removal of 5 mm. of tendonous end of muscle. Gold plates employed. Distal sutures passed through episcleral tissue and conjunctiva. Both eyes covered for five days.

Result.—Divergence reduced to 5 degrees. Advised advancement of left internus.

Case 40.—Male, age 29 years, single. Left eye crossed when 5 years old. Had used glasses unsuccessfully. Was operated upon when 11 years old on both eyes (presumably tenotomy both interni). Soon after operation left eye diverged. Had two more operations when 15 years old (presumably advancement of both interni), but eyes still diverged.

Examination.—Left divergence 30 degrees plus (Priestly-Smith); insufficiency of convergence. Prismatic measurements unsatisfactory. With right covered, central fixation with left. An unsightly pink subconjunctival mass was visible at inner canthus of each eye.

Retinoscopy Under Homatropia.—R. 1.5 D. H. =1.0 D. C.; L. 2.0 D. H.=0.5 D. C. Was wear-

ing R. +1.5=0.5 Cyl. 90°; L. +3.0 when he applied for examination and treatment.

Vision.—R. 20/15 with cylinder; L. 20/200.

Operation. — Local anesthesia; advancement left internal rectus conjunctival section about 6 mm. from cornea; mass under conjunctiva grasped and dissected from its surroundings. Needles with gold plate passed through this mass. Advancement as close to cornea as possible, sutures being passed through episcleral tissue and conjunctiva to insure firm anchorage and reduce giving of conjunctiva to a minimum. Eyes covered for five days. Plates removed on seventh day.

Result.—Reduction of deviation to half. Advised same operation on other eye. This operation has been of too recent a date to complete the treatment.

Case 42.—Man, 30 years old, single; gave history of seeing double following cranial injury 18 months previously. Decompression operation 6 months after the injury.

Examination.—Right eye showed a deviation upward of 14 degrees (prismatic) with slight deviation outward; has had no treatment for his eye condition.

Skiascopy Under Cycloplegia.—Right and left 1.0 D. H.

Vision.—Right and left 20/15.

Operation. — Local anesthesia; advancement right inferior rectus; Wiener plates employed. Both eyes bandaged for four days. Plates removed on sixth day.

Result.—Six months later deviation of 7 degrees (prismatic); advancement of left superior rectus advised, but refused.

Case 43.—Male, 21 years old, single. Had a paresis of the right superior oblique, evidently congenital. Had worn glasses irregularly with no change in the condition. When 16 years old had tenotomy of right inferior oblique in New York City by a prominent oculist without improvement. There was a deviation of the right eye upward and when the patient looked toward the left the eyeball rolled upward and inward.

Skiascopy Under Cycloplegia. — Right and left, 2.5 D. Hy., 1.0 D. astigmatism.

Vision.—Right, 20/100; left, 20/20.

Operation in this case was done under protest on account of insistence of the patient who contemplated marriage. Local anesthesia. The right inferior rectus was advanced until there was an apparent over-correction. (Wiener plates employed.) Both eyes bandaged for four days. Plates removed on sixth day.

Result in this case was most gratifying, as the eyes were apparently level after the operation and showed marked reduction of the tendency of the eye to shoot upward and inward when looking toward the left.

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4. Guerin: Am. d' Ocul., 1849.
5. Critchett: Lancat., 1855, p. 497.
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7. Savage: Ophthalmic Record, 1895, p. 474.
8. Wiener: Trans. of the Acad. of Ophthal., 1919, p. 264.

DISCUSSION

Dr. Charles A. Bahn, New Orleans, La.—The intelligent discussion of any ocular muscle operation should be premised on one's expectations of the different types of operative procedure.

Tenotomy is simple, incapacitates the patient but a few days, is somewhat inaccurate, not applicable to small deviations, produces a partial paralysis of the tenotomized muscle, and its results increase with time.

Advancement is fairly accurate up to about 15 degrees, necessitates usually prolonged binocular bandaging, may be technically difficult, and the sutures pull out.

Tucking is accurate up to about 15 degrees, is usually comparatively simple, necessitates only monocular bandaging, but is rather unsightly.

Resection is usually simple, comparatively inaccurate, because the excision of tendon is largely dependent upon the judgment of the operator.

My experience with metal plates is limited to one case in which I assisted Dr. Wilkerson, of Washington. That is hardly applicable in this discussion, because Dr. Pfingst's use of metal plates is entirely different.

My present impression is that the metal plate which Dr. Pfingst has shown us is a valuable adjunct to the various muscle operations with the exception of tenotomy and the operation of Dr. Briggs.

Those who have used this type of plate tell me that the reaction following its use is very limited. I believe the value of these plates is largely in preventing changes in the position of the muscle and adjoining tissues after the operation is completed, without inviting infection.

I am now experimenting on a combination of the tucking and resection principle, using the Bishop tendon tucker to determine the amount to be resected, placing the sutures somewhat like those in the Reese operation, tying them and then excising the muscle between the fingers of the tendon tucker. The idea is to obtain the accuracy of the tucking principle without its unsightliness and yet have the technical simplicity of the resection principle. At this time I cannot intelligently report on the end results.

It is only by intelligently experimenting that we can find a better, easier and quicker way of producing better operative end results. We should feel indebted to Dr. Pfingst for his intelligent experiments in the field of metal plates.

Dr. Giles C. Savage, Nashville, Tenn.—A complete tenotomy is said to do too much and a partial not to do enough. I agree as to the complete tenotomy, but not as to the partial. Do not do a complete tenotomy even on a patient afflicted with squint. If you do you will probably over-correct the squint. Use a suture tucking in the weaker muscle with partial tenotomy of the stronger. You will find the results far more satisfactory, and there will be no risk of over-correction.

Let me pass to the question of metal plates. The plate of Dr. Wilkinson is not a suture plate at all. It is a splint that is intended to do away with either partial or complete tenotomy by a paretic stretching the too strong muscle, the one causing the turning. Wilkinson associates with

his stretching splint the use of an advancement suture in the weaker muscles, but he cuts the muscle in two. No weak muscle, for shortening or advancement, should be cut in two. No tenotomy of the stronger muscle should be complete. When you wish to increase the strength of the weak muscle it should be without cutting the muscle. Do it with your suture. If you have a high degree of squint, do LaGleaze's flat advancement operation, if the tucking operation does not promise enough. It is described in my Ophthalmic Myology. The LaGleaze flat advancement without cutting the tendon is the only advancement operation that ought to be done. I say that without hesitancy.

The shortening operation which I devised many years ago and do today is not the deWecker operation at all. In my book I give the history of every sort of operation that has been done with a view to strengthening weak muscles, and among them is the deWecker. The operation I do is done with the aid of the Price plate. I was present at the birth of that suture plate twenty-six years ago. It has served me well. One plate for one operation is all that is needed. The purpose of the suture plate is to make easy the removal of the stitch. We had much trouble in removing the stitch before Price devised his suture plate, but now the sutures can be removed without interfering with the weak adhesions which have formed, and the cutting of the stitch is without any pain to the patient. There is another advantage in the use of the suture plate. The stitch will not cut out. You may be certain that it will stay. And if you tie a knot that will not untie, you are safe.

Never bandage the eye when you are operating on the ocular muscle. You want binocular vision to be established as quickly as possible; and that there may be effort of the eye to establish binocular vision it must be an open eye. An eye that is covered will not put forth any effort. The open eye heals as kindly, if not more so, than if bandaged.

Dr. H. H. Briggs, Asheville, N. C.—The matter of tenotomy is not germane to the subject, but I should like to quote what I heard the one-time father of ophthalmology in the South say, some eighteen years ago. The man who at that time had more experience in ophthalmology and more years of practice than any one here has had said: "I am almost sorry that I ever did a tenotomy." He was speaking of the unfortunate over-effect which often follows tenotomy. At that time the advancement operation was hardly known, and tenotomy was practically the only operative procedure for squints.

I was very anxious to hear Dr. Pfingst's description of his operation. No one should criticise an operation adversely unless he has tried it, so I shall discuss it only in principle. I intend to try this method at the first opportunity. I shall be sure, however, to get the exact plates which Dr. Pfingst recommends, because in my experience you are often disappointed if you depend on dealers to supply you with such delicate things. I am a little disappointed in that Dr. Pfingst cuts the muscle. I do not like an advancement operation that severs the muscle, for the reason that unless the muscle is advanced and maintained until healing is complete along the line of its original direction, you are very liable to get what Dr. Savage calls a cyclophoria. In other words, you may get a union above or below the original insertion with a resulting cyclophoria.

Another objection, in principle, to Dr. Pfingst's operation is that there are two kinds of foreign bodies used, two kinds of suture material. The principal incentive which caused me to try to add another operation to those which already existed was to eliminate the soft suture material, which never remains quite so sterile as does a metal suture, especially silver. There is nothing the conjunctiva will tolerate so well as silver.

I should like Dr. Pfingst to tell us where the reinsertion is, how near to the old insertion, and whether there is inflammatory adhesion and union back toward the equator of the eye. In my operation I have found that the new insertion is jammed up against the old insertion. I have found this by re-operating on cases of paresis of a muscle. I have advanced the same muscle three times, and there was found no inflammatory adhesion back of the original insertion. You have all had the experience of trying to advance a muscle that had been previously advanced, and found at times that one must go back almost to the equator to find the new insertion.

I should like also to know how long it takes to do this operation. One thing I claim for my operation is that it can be done quickly, in two or three minutes, and that is something the patient appreciates.

There is one criticism I have for this operation, as I have for my own, and that is that it leaves something in the eye to be taken out. Of course that is true of every advancement operation. It is often difficult to remove even silk suture from the eye. In my operation it takes but a few moments to remove the link provided you have the proper kind of cutting forceps. They are proper only when they are sharp.

Dr. John Green, Jr., St. Louis, Mo.—I was very glad to hear Drs. Pfingst and Savage adversely criticise complete tenotomy. When we are dealing with an eye to correct squint and feel that we must do a tenotomy, it should be partial. If, after an advancement operation, there remains a residue of squint, a second operation some weeks hence on the other eye is indicated.

The unsightly lump that has been spoken of as a sequel of the tucking or folding operation is rare in my experience. I have done many tucking operations, using the Bishop tucker, with a reinforcing silk suture, similar to that used in the Reese operation. Dr. Wiener's operation, which Dr. Pfingst so well described, has one drawback. The conjunctival stitch is apt to stretch, thus permitting some recession. Dr. Moulton informs me that in recent operations Wiener has included some scleral tissue in the stitch adjacent to the cornea.

Dr. F. O. Schwartz, of St. Louis, has recently suggested an operation with gold plates which does not involve cutting the tendon. The tendon

to be shortened is split in the direction of its fibres, and two loops, one above and the other below, are formed. These are separated and held apart by two tension sutures. Two double armed sutures are passed through a small gold plate with four holes and then through the conjunctiva. The first two of these sutures are passed through both sides of one portion of the split tendon so as to include the angle formed by the tension suture. The next suture is passed through both sides of the muscle angle about two millimeters from the point where the first suture pierced, and also includes both sides of the muscle angle.

The other part of the muscle is treated in a similar manner, and the four needles are passed through the conjunctiva near the edge of the original conjunctival incision, but on the opposite side of the wound, and tied over a second small gold plate like the first, after having been threaded through it. Both eyes are bandaged and the plates removed in about eight to ten days. (For detailed description see Am. Jour. Ophthalm., November, 1921, pp. 806-809.)

Dr. Pfingst (closing).—I should like to correct the impression that this is my operation. There is nothing original about it. The incentive for this paper was the fact that I have used the plates in eye surgery and have been impressed with their usefulness. The plates do not have to be confined to any one operation, but can be employed in almost any method. The strong features of the plates are their ability to hold the muscle without ligating a portion of it, and their ready application.

As to the presence of these plates in the eye, you would be surprised to find that there is no reaction at all and that the patients do not complain of their presence. When I got Dr. Price's plates I felt sure that the patients would not stand them, as they are quite a little larger than the Wiener plates, but I have found in the few cases in which I employed them that they were borne as well as the smaller plates.

Regarding the removal of sutures, I should say that this is quite simple and was mentioned as an advantage over other operations with complicated sutures, such as in the Worth operation. The thread forms but a simple loop to hold the plates in apposition. The plates readily drop out when the thread is snipped with the pointed end of scissors.

As to using two plates, the point spoken of by Dr. Savage, I believe that if the one plate keeps the thread from pulling out of the conjunctiva there can be no objection to putting another over the belly of the muscle to avoid tying the thread around a portion of the muscle.

Another point spoken of by Dr. Savage is the bandage. When you do a tenotomy the principle of keeping both eyes open after the operation seems reasonable; for as the eyes get into a position of parallelism, union of the divided muscle takes place with the eyes straight. But after an advancement it seems to me that we should endeavor to obtain union of these muscles at their advanced position before allowing the eye to be moved about. This is the idea in keeping both eyes covered for four days or longer. I believe that our results are mostly cosmetic and that there is binocular fixation, but not binocular single vision, as Dr. Savage seems to believe. It is perhaps possible to bring about binocular single vision later by orthoptic treatment in a limited number of cases.

As to adhesions, I believe in most cases the adhesions are due to the fact that the operator, in an endeavor to get his squint hook under the muscle, uses more traumatism than is necessary. If you make a small opening in Tenons capsule above or below the tendon you can usually get your hook under the muscle readily, thereby avoiding traumatism and extensive secondary adhesions.

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EDITORIAL DEPARTMENT

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ACCIDENTAL INJURY TO THE URETER

One of the great tragedies of surgery is the accidental severance of a ureter, which almost invariably is a problem of the female.

COMMON CAUSES

To begin with, when such a calamity befalls the surgeon, he is always confronted with a serious operation such as a cervical fibroid distorting the normal relation of ureter and cervix; fibroids invading the broad ligaments; a ureter penetrating a growth; a large ovarian cyst densely bound down; extensive chronic pelvic inflammatory disease; excessive hemorrhage, etc. The situation is not brightened by recalling that the patient has already suffered a certain amount of shock and that unnecessary delay may prove dangerous.

MODES OF TREATMENT

If the ureter is nearly or entirely severed, there is a choice of seven main courses to pursue, namely, uretero-ureteral anastomosis, implantation of the ureter into the bladder, permanent ligation of the proximal portion of the ureter, transplantation of the ureter into the lower bowel, bringing the ureter into the cervical stump or into the vaginal cuff, bringing the ureter to the surface of the body, and the immediate performance of a nephrectomy upon the injured side.

The emptying of the ureter anywhere outside the urinary tract invites ascending kidney infection aside from the patient's discomfort over being continually wet and chafed. Therefore, except under most unusual and impelling circumstances, we need consider only ureteral anastomosis, permanent ligation of the proximal end of the ureter, and implantation of the ureter into the bladder. Each has its staunch advocates.

URETERO-URETERAL ANASTOMOSIS

In favor of ureteral anastomosis is the claim that it approaches the normal more nearly than any other procedure. Opposed to it are the facts that it is time-consuming and results in many failures. Should union be accomplished, a stenosis or stricture is rather frequent, in which case treatment by dilatation being dangerous, permanent injury or even destruction of the kidney may follow.

LIGATION OF THE SEVERED URETER

A rather widely used method of recent years is that of deliberate ligation of the proximal end of the cut ureter with a permanent material such as silk or linen. Two or even three ligatures are applied for safety. That it is successful in preventing a fistula, is attested by a number of cases reported. A feature in its favor is that it completes the work at one operation and thus may avoid a damage suit against the operator, which a resulting fistula and proposed nephrectomy may stimulate. (The lawyer who once brought damage suits against employer, since the day of the workmen's compensation laws, now sues the surgeon.) Where

a subsequent nephrectomy is sure to follow, it saves that operation.

The most outstanding objection to the ligation-and-renal-atrophy plan is that it is uncompromisingly destructive at a time when the functional capacity of the other kidney is unlikely to be known, and when the shock of back pressure on the ligated side may produce a pyelonephrosis if infection previously existed, so that nephrectomy later will be called for after all.

One of Graves'[1] cases had complete suppression of urine for thirty-six hours but ultimately recovered. Barney produced anuria in 1.6% where one ureter was ligated. One should never ligate without a history of a previously negative urinalysis, and a careful examination to make sure that the opposite kidney exists and that its ureter seems intact. The vermicular movement of a stimulated ureter is a phenomenon very useful to remember in identifying and tracing it.

URETERAL ANASTOMOSIS WITH THE BLADDER

Ureteral implantation into the bladder is a favorite with many. The technic is more simple than uretero-ureteral anastomosis, and if reasonable care be exercised, union will likely follow. The cardinal points to observe are the avoidance of tension upon the suture line, the use of a small puncture opening into the bladder, the complete closure of the opening around the ureter, the buttressing of the suture line with the ureteral fascia fastened to the bladder wall and the closing over the site with all available soft parts.

To avoid tension where it would otherwise exist, the ureter with its fascia may be freed for some distance upward. The bladder may be carefully dissected up from the under surface[2]; and a point that we have never seen mentioned is the sacrificing of the opposite round ligament and the use of the other to pull the cervix and bladder upward and toward the injured side. Of course an indwelling Pezzer catheter is used to prevent bladder distension and leakage.

It is rightly objected to that the ureteral transplantation into the bladder if unsuccessful leaves not only a ureteral fistula but a bladder fistula to deal with.

CONCLUSIONS

From what has been said it is evident that no ideal plan for handling an accidentally severed ureter has yet been devised. Each method has its advantages, its contraindications, and its drawbacks. In such an emergency the surgeon should quickly review in his mind the several procedures and consider each with due regard to the condition of the patient, the location of the injury, and his own operative ability to employ the several methods. All things being equal we are slightly inclined to favor the ureteral anastomosis with the bladder.

Most important of all is an attempt at preventing ureteral injury by catheterizing the ureters prior to any operation where for instance there is a tumor entirely filling the pelvis or where the mass can be felt extensively invading a broad ligament.

1. Graves, W. P.: Boston Med. and Surg. Jour., 1917, clxxvi, pp. 149-51.

2. Furniss, H. D.: Am. J. Obstet., 1918, lxxviii, pp. 14-21.

CLINICAL MEDICINE AND CHEMISTRY

"We are now witnessing a cautious revival of the use of drugs in the treatment of disease."[3] This revival, or reaction from what has been called the thera-

3. Barker, L. F.: Value of Drugs in Internal Medicine. J. A. M. A., 77, 15, p. 1152.

peutic nihilism of a few years ago, owes its existence to the confidence inspired by the success of a few useful drugs and to the vast amount of research which has given specifics for definite diseases or dysfunctions, and has so purified these and improved the methods of manufacture that their dosage may be accurate. The failure of drugs introduced after little or insufficient research is shown in the failure of patent medicines. That the importance of research is known even by the makers of these is shown by the recent inclusion of laboratories in many of their places of manufacture.

Thirty years ago there were on the market 2,699 drugs. Today there are more than 45,000.[1] The number has increased out of all proportion to the amount of study, and serves to show the crying need for more laboratory work.

The need of cooperation between the different branches of medicine is felt in many sections. Its incompleteness is the greatest danger from the overwhelming wave of specialism which is sweeping the country. Chemistry, inorganic, organic, physical and biological, is almost like another specialty of medicine. It is so interwoven with it today.

Modern ideas of diabetes are, of course, the outgrowth of prolonged laboratory study and continued qualitative and quantitative analyses of blood and urine for different components. The accuracy of these analyses depends upon chemical methods which have evolved slowly, from patient and painstaking effort, from experiments repeated over and over. To quote the conclusion of Dr. Joslin's[2] article in this issue of the JOURNAL:

"* * * * * not to the general practitioner, not to the clinician, are the anxious eyes of the parents of the little diabetic child turning today, but to the laboratory worker; to your Opie and Shaffer, to our Benedict and Cannon and Folin, and a host of others, chemists, physiologists and pathologists unostentatiously active here and there throughout the country. Are you and I doing what we can to encourage these men who seldom have the gratitude of patients to reward their patient endeavor? Do we tell our patients to help them and to foster their laboratories? Practitioners, clinicians, scientists, diabetes is a disease which needs the help of you all."

Many different complex substances, cocain, digitalis, morphin, different so-called "biologicals" and extracts of plants have been found therapeutically useful. The work of the chemists and pharmacologists is to separate and identify the beneficially active principles from the harmful or inert ingredients. For example, cocain was found to contain an anesthetizing substance mixed with many poisonous materials. From it procain, apothecin, and many other much less harmful substances with the desired anesthetic action, were derived.[1]

Chaulmoogra oil was long believed to be of use in the treatment of leprosy, but was intensely nauseating and often dangerous to the patient. From it have been isolated esters of organic acids with which actual cures of this world-old plague have been made.[1] [3]

The history of the discovery of salvarsan is one of the most spectacular in modern research. Ehrlich was studying the physical and chemical principles which determine the distribution of compounds in the animal body. He employed dyes, since their distribution was easily determined. Some, he found, had an affinity for blood corpuscles. He determined by analysis what chemical group was the cause of the injurious effect of the dye upon certain parasites, and from that he progressed to the study of arsenic compounds; and his famous six hundred and sixth result he called salvarsan.

1. Abel, Alsberg, Bacon, Eldred, Hunt, Johnson, Stieglitz, Taylor, Herty: The Future Independence and Progress of American Medicine in the Age of Chemistry, 1921.
2. Joslin, E. P.: A Discussion of the Newer Methods in the Treatment of Diabetes, p. 93.
3. McDonald: J. A. M. A., 1920, vol. 75, p. 1483.

It is not intended to emphasize the work of the laboratory over clinical effort. The final test is obviously: does it work in the human body?

"The introduction of new therapeutic methods and new drugs can scarcely be expected from now on to be arrived at by accident, or through pure empiricism. Every new therapeutic agent should * * * be thoroughly tested in the laboratory * * * before it is introduced into general medical practice. But results in clinical experience must ever remain the final and crucial test of every form of therapy."[1]

This principle is repeated by Wilmer:[1]

"And if perchance there should be a conflict in testimony between the test tube in the laboratory and the results of carefully considered therapeutic tests in the consulting room or clinic, my voice would be raised in favor of the latter until such a time as the results could be harmonized."

If results in the test tube and in the body appear to be contradictory, it is an appearance only, because we are comparing unlikes. It occurs because there are in the body unknown reagents which may some day be determined.

The body is a vast chemical laboratory. The cell, its unit of structure, is, according to Crile,[2] a diminutive electric battery, containing simple and complex substances. The principles which govern the cell and govern the body are the principles of chemistry and physics. Clinical medicine can hope to undergo very little development without first an advancement of the laboratory branches, chief among which is chemistry. Physicians should follow the advances in the laboratory branches with the same interest with which they follow those of the clinical specialties, and should remember the debt which the art of medicine owes to chemistry.

1. Reber, quoted by Wilmer, W. H.: Value of Drugs in Ophthalmology. J. A. M. A., 77, 16.

2. Crile, G. W.: Value of Drugs in Surgery. J. A. M. A., 77. 15.

CHATTANOOGA THE CONVENTION CITY

The Southern Medical Association was born in Chattanooga in October, 1906, for it was there at a meeting of the Tri-State Medical Society that it was decided to invite the physicians of Florida, Mississippi and Louisiana to unite with those of Tennessee, Georgia and Alabama to form a six-state medical organization. At this historic meeting Dr. H. H. Martin, of Savannah, was made the first President of the Southern Medical Association; and he, with Dr. Jere Crook and Dr. Raymond Wallace, sat up all of one night to write its Constitution, which, by the way, has not been changed materially since it was written. Three years later it was decided to invite the physicians of all the fifteen Southern states to come into the Association. Thus was evolved the organization which in fifteen years has become "the second largest medical association on the Western Hemisphere and the most independent on earth."

The members of the old Tri-State Medical Society, which formerly met every year at Chattanooga, have remained loyal to the organization which they organized and they have longed to go back to the delightful and historic city which has for them many tender memories of the long ago. The physicians of Chattanooga, who are among the most progressive in the South, have been enthusiastic members of the Southern Medical Association throughout the years of its existence, and they have insisted that the Association come back to the city of its birth. At Hot Springs the Council decided that the Association should go back to Chattanooga, and since then there has been rejoicing among the doctors of the South. They will have the privilege of attending a meeting where, in addition to the scientific programs, there will be added the natural and historic attractions of the beautiful city, almost encircled by Horse-

shoe Bend of the Tennessee River, and surrounded by mountains whose scenery is unsurpassed.

Among the attractions of Chattanooga are its hotels. The Hotel Patton, with the Annex, is one of the finest commercial hotels in the South. The Hotel Park in the down town section is the newest of Chattanooga's hostelries; and the big old Reed House, familiar to those of Tri-State days, is being remodeled to compete with the modern hotels. Perhaps the most attractive hotel available to visitors to Chattanooga is the Signal Mountain Hotel. Though it is twelve miles from the city, a trolley line with half-hour schedules and paved automobile roads winding through the palisades of the Tennessee River up to the summit of Signal Mountain make it of easy access to those who delight in the scenery, golfing, tennis, swimming and other pleasures of mountain resorts. The Signal Mountain Hotel, which has 200 rooms, every one with bath, is fireproof and is modern in all its appointments. It will attract many physicians who go to Chattanooga with their wives to combine rest and pleasure with the scientific work of the Association.

In Chattanooga those familiar with history will be interested in visiting Lookout Mountain, where was fought the Battle of the Clouds, Missionary Ridge, Waddon's Ridge, Chickamauga and others made sacred in the fierce fighting around Chattanooga in the dark and bloody days of the Civil War. These attractions will make many physicians who attend the 1922 meeting prolong their stay for two or three days after the meeting.

Nature and the fate of history have combined to make Chattanooga one of the most delightful and interesting cities in America, but the physicians of the city are not relying upon those attractions to make the November meeting a success. Though it is ten months distant, they are thoroughly organized and are already working to make the Chattanooga meeting one of the memorable occasions in the history of the Southern Medical Association.

THE PAST DECADE OF THE ASSOCIATION'S LIFE

It is not complimenting the Association too highly to say that the history of its development is more or less the index of the development and progress of Southern medicine. If we look over the ten-year period from 1911, when the Association was a promising babe, subject to the vicisitudes of fortune and the mercy of its many parents, to 1921, we note a marked change in the Association's programs. Though we must always hope that the quality of the articles is steadily improving, we realize that the papers of ten years ago were scientific, well written and of a kind that we should always be proud to claim as Southern. The change in 1921 is rather in the number of men who now interest themselves in a general meeting, and the growth of specialism which is as striking as the growth of the Association itself.

In 1911 there were just three sections, Medicine, Surgery, and Ophthalmology. At that time the profession in the larger Southern centers was divided mainly into physicians, surgeons, and eye, ear, nose and throat men. For instance, a man usually specialized in surgery only after he had built up a fairly large general practice.

In 1912 a new section was added: Hygiene and Preventive Medicine (now known as Public Health).

By 1916 there were six sections, and in 1919 there were eight sections, two affiliated associations and one jointly-meeting association, though we had by no means recovered from the war. And in 1921, which probably represents many of the war's stimulating effects upon medicine, there were thirteen sections, three affiliated associations and one jointly-meeting association. This is indicative of the rapid growth and success in the South of all these divisions of our labor. In 1911 there were 148 papers which covered practically every general subject that we find in the programs of today, and in 1921 there were 213. This is not a proportional increase. The difference in the meeting of ten years ago and the meeting of this year lies mainly in the number of men now capable of discussing a paper intelligently and of adding something to the ideas expressed by the author. Where formerly there were only a handful of such persons in each section, the number has now increased a hundredfold. The membership of the Association in 1911 was about nine hundred, while it is now six thousand five hundred, a gain of five thousand six hundred, or more than five hundred a year.

Each time a new section was established there has been some opposition to it. Some doubt of its need existed till after the first meeting, after which there was never a question of dropping it. We have been as lucky in the choice of officers for the new sections as for the old, and this has probably contributed to their success.

Many members of each section are of course general practitioners, who derive benefit from the special and intensive study of the men whose practice is limited. On the other hand, these general practitioners bring to the section the advantage of their less biased minds. We feel that both types contribute greatly to the Association, and through it to the profession at large.

We are likewise proud of our public health work, which has been one of the main inspirations since the Association was founded. There may have been in the beginning a feeling of opposition on the part of some to public health work, for instance, toward malaria work, which seemed to destroy part of what they considered their legitimate practice. The realization is more general now that unfortunately there will always be enough sickness to go round, that the doctor holds his place in the public heart because of his peculiar service and professional character, and that the minute he combats preventive measures for selfish reasons he marks himself as a reactionary and an egoist, and thus loses the practice which he is trying to maintain. There is no physician in the South, we feel today, who is not eager to strengthen every effort for more extensive preventive medicine.

In the last decade, despite the interference of the greatest war in history, the Southern medical men, and through them the Southern Medical Association, has taken these phenomenal strides forward. After the war our physicians took up the work where they had left off. Broadened by their experiences, they in turn have enriched their Association and their JOURNAL. It has been a memorable ten years. Our hope for the same advance for the Association and its members in the next decade may sound a bit trite, but we have faith in it.

Correspondence

A REBUTTAL

Editor, SOUTHERN MEDICAL JOURNAL:

Let me thank you for your editorial on "Digitalis in Cardiac Disease: Resume of the JOURNAL'S Recent Articles." You say, "Dr. Jones makes most sweeping repudiations of its efficacy in all conditions." You say further, "Since the weight of opinion is against him, it would perhaps have been better had Dr. Jones' paper contained detailed case reports." I beg to advise that I have detailed case reports in papers perhaps for the last fifteen years, too innumerable to mention. You also state that "To use digitalis in auricular fibrillation is an axiom of medicine." We have had many axioms in medicine that have hastened patients to their graves: for instance, starvation diet in typhoid fever, antimony and bleeding in pneumonia, aided and abetted by blistering, shutting out all air from the patient and giving him but little water.

It was also a surgical axiom twenty years ago to curet every woman who had an abortion. Axioms have prevailed from Hippocrates to the present time. In fact, axioms have been the curse of medicine.

Let's discuss axioms further. In 1898, in an address before the Tri-State Medical Association of Arkansas, Mississippi, and Tennessee, for "A More Rational Diet in Typhoid Fever," the discussion that followed was unanimously against my position, the consensus of opinion conforming to the "axiom" that my position was very irrational. Today every hospital in the world is giving liberal diet in typhoid fever.

Let's cite another axiom. In 1903, in the annual address before the Chicago Medical Society, I took the position and called attention to the fact that in the domain of heart disease we had "A Syphilitic Endocarditis" just as acute and just as characteristic as any other type of infectious endocarditis. At that time all text books on diseases of the heart repudiated this fact. This address was delivered four years before Hoffman and Schaudinn discovered the spirochete. This address can be found in Vol. XLII, January 2, 1904, of the *Journal of the American Medical Association.* Since the discovery of the spirochete numbers of papers have been written by the best men of the world on syphilitic endocarditis as a pathological entity. Had I conformed to axioms I would not have had the courage to oppose the accepted views.

Fifteen years ago it would not have been fashionable to read a paper on infections without putting on the frills of the opsonic index. We don't hear much today about the opsonic index.

My statements bearing on digitalis may seem sweeping, but nevertheless they are true, regardless of whether we give large or small doses, regardless of the preparations. That digitalis has a place in cardiac therapy is admitted, but that the claims are extravagant is as clear as the noonday sun to any thinking man. We are told now that digitalis is contraindicated in myocardial troubles following diphtheria, but that it is all right in other myocardial degenerations. Perhaps this will become a digitalis axiom.

I may be in the minority with the enthusiastic teachers in the large medical centers, but I think I am in the majority with common sense practitioners of medicine.

I shall use my voice throughout the Southland against this enthusiastic wave of large doses of digitalis, even though the whole world be against me. We need today some really good clinical carpenters to patch up and repair scientific tinkering.

FRANK A. JONES.

Memphis, Tenn., Dec. 10, 1921.

Book Reviews

Diseases Of The Digestive Organs, with special Reference to Their Diagnosis and Treatment. By Charles D. Aaron, Sc.D., M.D., F.A.C.P., Professor of Gastroenterology and Dietetics in the Detroit College of Medicine and Surgery, Consulting Gastroenterologist to Harper Hospital. 3d edition, thoroughly revised; illustrated with 164 engravings, 48 roentgenograms and 13 colored plates; 904 pages. Philadelphia: Lea & Febiger, 1921.

This, the third edition, is of necessity thoroughly revised, in order to represent the present knowledge of gastro-intestinal diseases. Many new methods, as the fractional gastric analysis, the non-surgical drainage of gall bladder, etc., have a definite place in diagnosis and treatment of digestive disorders. These are properly and completely incorporated in this edition. A very strong chapter is on the examination of the intestinal contents and feces. Gastric neuroses, cardiospasm, etc., are fully discussed.

If more of the general practitioners would study carefully this excellent book, fewer of their patients would have to go to the specialist. The text is clear, definite, and authoritative.

Principles of Human Physiology. By Ernest H. Starling, C.M.G., F.R.S., M.D., Hon.Sc.D. (Cambridge and Dublin), F.R.C.P., Jodrell Professor of Physiology, University College, London. The Chapter on the Sense Organs Revised and Largely Rewritten by H. Hartridge, M.A., M.B., Cantab. Third edition, with 579 illustrations, 10 in colors, and 1315 pages. Philadelphia: Lea & Febiger.

The material and the energetic bases of the normal body are two phases with which Starling introduces his classic work. The only foundation for rational therapeutics, he says, is the proper understanding of the normal human body. Its material basis consists of the elementary constituents of living cells, and proteins, carbohydrates, mineral matter, etc. Under the head of the energetic basis he describes the mechanism by which the body is able to change its condition: the energy of molecules in solution, osmotic pressure, properties of colloids, etc. Various parts of the body and its normal processes then make up the main part of the book which is a large minded and very capable study of the normal human being.

Genito-Urinary Diseases and Syphilis. By Henry H. Morton, M.D., F.A.C.S., Clinical Professor of G. U. Diseases in the Long Island College Hospital; G. U. Surgeon to the Long Island Hospital, Kings County Hospital, and Polhemus Memorial Clinic; Member of Committee on Venereal Diseases in the Office of the Surgeon-General; Consulting G. U. Surgeon to the Flushing Hospital, to the Sea View Hospital of Department of Health, New York City, to the Bushwick Hospital, and to the Beth Israel Hospital of Newark, N. J., Member of the A.U.A.; F.A.C.S.; Fellow of the New York Academy of Medicine, etc. Fourth edition, revised and enlarged, 805 pages, 330 illustrations and 36 full-page colored plates. St. Louis: C. V. Mosby Co.

The fourth edition brings up to date an always popular book, which deals with common urological diseases. Men are considered primarily. The plates, showing magnified and normal diseased tissues and bacteria as well as various crystals, radiograms, skin conditions, etc., are highly elucidating. It is a very good book.

Clinical Diagnosis. A Text-Book of Clinical Microscopy and Clinical Chemistry For Medical Students, Laboratory Workers, and Practitioners of Medicine. By Charles Phillips Emerson, A.B., M.D., Late Resident Physician, The Johns Hopkins Hospital, and Associate in Medicine, The Johns Hopkins University: Professor of Medicine, Indiana University School of Medicine. 726 pages, 156 illustrations. 5th Edition. Entirely Rewritten and Reset. Philadelphia: J. B. Lippincott Company, 1921.

In the period of ten years since the last edition many new methods have been developed, and new facts have been discovered, so that this fifth edition has been re-written and is practically a new work. It emphasizes the importance of the clinician's keeping more closely in touch with the laboratory work for his patients. The chapters on sputum, urine, stomach contents, intestinal contents and feces, the blood, cerebrospinal fluid, other fluids, are complete and present the modern methods of examination. It is really a standard reference and guide to thorough clinical diagnosis.

Surgical and Gynecological Nursing. By Edward Mason Parker, M.D., F.A.C.S., Surgeon, Providence Hospital, Washington, D. C., and Scott Dudley Breckinridge, M.D., F.A.C.S., Gynecologist, St. Joseph's Hospital, Lexington, Kentucky. 425 pages, with 134 illustrations in text. Second edition, revised. Philadelphia and London: J. B. Lippincott Co., 1921.

An excellent text book may always be criticised in minor points. One of the few objections that could be raised is that in a book primarily for nurses the preparation of Dakin's solution is described; and it is stated that the solution may be kept ten to fifteen days. More knowledge of chemistry is required for this than the average nurse possesses, and it is best to keep Dakin's solution for a shorter period.

The technic of nursing described, however, is practically irreproachable.

The Heart Rhythms. By Paul Dudley Lamson, M.D., Associate Professor of Pharmacology, Johns Hopkins University, Baltimore. 52 Text Figures and 100 pages. Baltimore: Williams and Wilkins Co., 1921.

The author states in his introduction that the object of this book is not to present anything new in regard to the cardiac rhythms but to consider them as a whole and in relation to each other, separated from the mass of intricate information concerning curves, instruments, cardiac physiology, etc. The book is the result of studies in London in 1912 and teaching at the Peter Bent Brigham Hospital, Boston, and more recently in connection with the work in pharmacology at Johns Hopkins University.

The work is divided into two parts. Part 1 consists of five chapters. Taking up a consideration of the cardiac rhythms, the author uses electro-cardiographic curves to explain this subject and accomplishes his purpose very clearly.

His opinions as a whole are in keeping with modern cardiology but one would infer that the premature contraction arising in the ventricle was of graver significance than is generally held from his teaching.

The sections on auricular tachycardia, auricular flutter and auricular fibrillation are well prepared.

Part 2, comprising three chapters, takes up the interpretation of graphic records and the method of taking polygraphic tracing. On the whole it is clearly enough written, but it is just a question whether or not in an elementary book of this type it is not out of place to go into details about the interpretations of difficult electrographic tracings as is done, for example, on pages 60 and 61. The omission of the reproductions of the six different types of polygraphs would also have been of advantage. It is to be regretted that the author does not use the B. N. A.

The illustrations are clear and the text free from typographical errors. The book is also attractively made and contains an adequate index. It should prove of use to the medical student and of service to physicians as an introduction to this subject.

Modern Italian Surgery and Old Universities of Italy. By Paolo De Vecchi, M.D., F.A.C.S., Corresponding Member, Royal Academy of Medicine, Turin, with a Foreword by George D. Stewart, M.D., President, New York Academy of Medicine. 249 pages with 15 full-page illustrations. New York: Paul B. Hoeber, 1921.

An Italian by birth and education, but an American by adoption, the author gives a brief review of the surgery of the Italian universities during the past fifty years. He attempts to secure for Italy the recognition it rightly deserves in the surgical world. The nation that produced such men as Bassini, Porro, Bottini and others is worthy of our consideration and study. The work will be found especially useful for those who would familiarize themselves with modern surgical Italy preparatory to a tour of foreign clinics.

The Blood Supply To The Heart—in its anatomical and clinical aspects. By Louis Gross, M.D., C.M., Douglas Fellow in Pathology, McGill University, and Research Associate, Royal Victoria Hospital, Montreal. With an introduction by Horst Oertel, Strathcona Professor of Pathology, McGill University, Montreal. With twenty-nine full page plates and six text illustrations. New York: Paul Hoeber, 1921.

It is seldom that a reviewer has the opportunity of reading a book so clearly written or one that shows more careful thought and study in its preparation. This book has a place among the real contributions to modern cardiology.

It is suited to the pathologist, anatomist, and internist, rather than to the general practitioner. The author searches for facts rather than attempts to prove theories.

Chapter VIII, "Age period changes in blood supply of to the heart and their pathogenetic relations," is of especial clinical interest. The illustrations are clear and the book is remarkably free from typographical errors.

Benign Stupors: A Study of a New Manic-Depressive Reaction Type. By August Hoch, M.D., Late Director, Psychiatric Institute, New York State Hospitals, Ward's Island; Late Professor Psychiatry, Cornell University Medical College. Edited by Dr. John T. MacCurdy, Lecturer on Clinical Medicine, Cornell University, New York City. New York: The Macmillan Co., 1921.

The study is presented in fifteen chapters and in a manner that will prove of value to all who are interested in psychiatry. One of the best points about the work is that the author is conservative in all his deductions, and submits the data from which he draws his conclusions. It is a useful little book.

Text Book of Embryology. By Frederick Randolph Bailey, A.M., M.D., Formerly Adjunct Professor of Histology and Embryology, College of Physicians and Surgeons, New York City, and Adam Marion Miller, A.M., Professor of Anatomy, Long Island College Hospital, New York City. Fourth Edition, 663 pages, and 503 illustrations. New York: Wm. Wood & Co., 1921.

The fourth edition is but a refinement of a well-known elementary text book of embryology whose popularity has stood the test of twelve years of class room use. The new edition brings the text fully up to date.

Medical Record Visiting List or Physicians' Diary for 1922. New York: William Wood and Company.

Many physicians already use this visiting list, and those who do not will find it of great service, not only in keeping record of professional work, but in referring to the many helpful tables of dosage, differential diagnosis of contagious diseases, obstetrical record, etc. It contains valuable information that has been modernized and many blank forms that will be found of daily service.

The Practice of Urology. By Charles H. Chetwood, M.D., LL.D., F.A.C.S., Former Professor of Genito-Urinary Surgery, New York Polyclinic, etc. Third Edition. 830 pages. Illustrated. New York: William Wood & Co., 1921.

The chapters in this edition devoted to genito-urinary surgery are excellent and prove to the reader that the author has a deep knowledge of this branch of urology.

Unfortunately the part of the work dealing with kidney functional tests, cystoscopy and pyelography is not up to the standard of the sections on surgery.

Syphilis is confined to a small space between pages seven and eight hundred. Naturally it is incomplete.

The redeeming feature of the book is its treatise on the surgical side of urology.

A Short History of Nursing. From the Earliest Times to the Present Day. By Lavinia L. Dock, R.N., Secretary, International Council of Nurses. In Collaboration with Isabell Maitland Stewart, A.M., R.N., Assistant Professor, Department of Nursing and Health, Teachers College, Columbia University, New York. 392 pages. G. P. Putnam's Sons, New York and London: The Knickerbocker Press.

This is intended for the student nurse, preferably in her first year, but it has a general literary and historical value as well. It traces the development of the profession of nursing from ancient days through the Middle Ages, when certain knights formed orders of nursing, through the dawn of modern nursing led by Florence Nightingale and the modern extensions of the nursing field.

It should be an inspiration to young and older nurses.

Southern Medical News

ALABAMA

Sixty-three malaria control projects are now under way in the State, as compared to one in 1917 and twelve in 1920, according to a statement of Dr. Samuel W. Welch, State Health Officer, Montgomery. The U. S. Public Health Service and the International Health Board will cooperate with the State in a tentative program for the work in 1922.

Dr. John C. Herrington, Laurel, Miss., formerly assistant to Dr. C. C. Bass in his private laboratory at New Orleans, will after February 15 be in charge of the laboratory of the Yarbrough Sanatorium, Columbia.

Work has been begun on the new Central Alabama Hospital in Clanton. The estimated cost will be $15,000 and the building will be pressed brick and stone. Officers of the corporation are: Dr. V. J. Gragg, President; Dr. T. J. Marcus, Secretary; W. N. Wyatt, Treasurer.

The Negro Tuberculosis Association of Alabama, in cooperation with the Alabama Tuberculosis Association, has been formed, to take care of negro tuberculosis victims in the State. Dr. Pierce L. Moton, President of Tuskegee Institute, is Director. Headquarters will be at Tuskegee and the work will be supplemental to the field work which is now being done under auspices of the Tuskeegee Institute. The tuberculosis work will be financed by the Christmas seals to be sold only to negroes.

The Pickens County Medical Society recently met and elected the following officers: Dr. E. P. Hill, McShan, President; Dr. S. R. Parker, Aliceville, Vice-President; Dr. Harvey Ashcraft, Reform, Secretary.

At a recent meeting of the Walker County Medical Society the following officers were elected: Dr. J. A. Goodwin, Jasper, President; Dr. G. S. Gilder, Carbon Hill, Vice President; Dr. J. F. Alexander, Jasper, Secretary.

Dr. James M. Long, Superintendent of the Baptist Hospital of Atlanta, has accepted the position as Superintendent of the Baptist Hospital of Birmingham and on January first assumed his duties.

A doctors' exchange has been established in Birmingham. The purpose for this is to handle the doctors' calls whenever their phones are left unattended.

The annual conference of County Health Officers was held in Birmingham, December 12-17 in conjunction with the graduate School of Medicine of the University of Alabama.

The administration building, the first unit of the Susie P. Stringfellow Memorial Hospital, Anniston, has been completed. It is a stone structure and is furnished with antiques and objects of art from Europe and the Orient. The main hospital will have a capacity of 60 beds.

The legislative act appropriating $25,000 for the treatment at the Pasteur Institute of indigent persons who have been bitten by rabid animals, has been approved by the Governor. This appropriation will be taken from the dog license fund.

Dr. Homer Harris and Miss Margaret R. Wilkinson, were married in Montgomery on December 10.

Deaths

Dr. Jacob G. Michnel, Mobile, aged 81, died December 12 following a long illness.

ARKANSAS

The Phillips County Medical Society, at a recent meeting, elected the following officers: Dr. Orlie Parker, Elaine, President; Dr. W. C. King, Helena, Vice President; Dr. M. Henry, Helena, Secretary-Treasurer.

The Jackson County Medical Society has elected the following officers: Dr. A. M. Elton, Newport, President; Dr. K. K. Kimberlin, Tuckerman, Vice President; Dr. Ira H. Erwin, Newport, Secretary-Treasurer.

The Independence County Medical Society has elected the following officers: Dr. W. A. Wyatt, Rosie, President; Dr. L. T. Evans, Mt. Pleasant, Vice President; Dr. M. S. Craig, Secretary-Treasurer.

The Jefferson County Medical Society recently elected the following officers: Dr. J. M. Lemons, President; Dr. W. T. Lowe, Vice-President; Dr. J. T. Palmer, Secretary-Treasurer.

The Lawrence County Medical Society has elected the following officers: Dr. W. W. Hatcher, President; Dr. Earl Thomas, Vice-President; Dr. A. J. Clay, Secretary-Treasurer.

Franklin County Medical Society has elected the following officers: Dr. A. J. Hansberry, President; Dr. E. W. Blackburn, Vice-President; Dr. Thomas Douglass, Secretary.

Prairie County Medical Society has elected the following officers: Dr. T. G. Porter, Hazen, President; Dr. James Parker, DeValls Bluff, Vice-President; Dr. W. W. Hipolite, DeValls Bluff, Treasurer; Dr. J. C. Gilliam, Des Arc, Secretary.

Work has been begun on the first unit of the Tuberculosis wards of the County Hospital at Little Rock. The building will cost $5,000 and will be of frame construction on a concrete base.

Sebastian County Medical Society has elected the following officers: Dr. A. F. Hoge, Fort Smith, President; Dr. E. C. Moulton, Fort Smith, Vice-President; Dr. W. R. Brooksher, Jr., Fort Smith, Secretary; Dr. H. H. Smith, Fort Smith, Treasurer.

Ground has been broken for the erection of the central wing of the new $300,000 Baptist Hospital at Little Rock. Three wings are to be constructed, the first will cost $100,000. It will have a capacity of 300 beds and will displace the present Baptist Hospital.

Dr. Benjamin D. Luck, Pine Bluff, and Miss Wordna Clements, Little Rock, were married November 15.

Deaths

Dr. Hartley Weems, Fort Smith, aged 68, died December 18, at the home of his daughter.

Dr. B. H. Green, Warren, aged 62, died early in January.

DISTRICT OF COLUMBIA

Four additional members of the faculty of the Georgetown University School of Medicine, Washington, have been announced as follows: Dr. Howard F. Strine, Surgeon in the United States Navy, appointed Associate Professor of the Principles and Practice of Surgery; Dr. Francis M. Munson, United States Army, retired, Lecturer on Prevention of Diseases; Dr. Henry S. Bernton, Lecturer on Hygiene, and Dr. Jas. A. Gannon, a graduate of the medical school, class of 1906, Associate Professor of Surgery.

At a recent meeting of the Medical Society of the District of Columbia, the following officers were elected: Dr. Archie W. Boswell, President; Dr. William H. Hough, First Vice-President; Dr. Prentiss Willson, Second Vice-President; Dr. J. Russell Verbrycke, Corresponding Secretary; Dr. Coursen B. Conklin, Recording Secretary; Dr. Edward G. Seibert, Treasurer.

A bill providing for an appropriation of $134,032 to meet the increased cost of land needed adjoining the Walter Reed General Hospital, Washington, has been presented in Congress by Senator Wadsworth, New York. On this property will be erected buildings for the Medical Museum and Library and the Army Medical School. The latter will be erected first at a cost of $500,000.

Dr. John Willard Vann, M. C. U. S. Army, Washington, and Mrs. Vera L. Davis, were married at Norfolk, Va., December 8.

Deaths

Dr. William Ford Arnold, Washington, aged 61, died in November at the St. Elizabeth's Hospital, from paresis.

Dr. Franz August Richard Jung, Washington, aged 52, died December 16 from heart disease.

FLORIDA

Dr. Raymond C. Turck, State Health Officer, has announced that the state radium clinic for the treatment of cancer, established at Jacksonville a year ago, for the treatment of cases of inoperable cancer in women, will hereafter be open to both men and women suffering from any form of cancer which may be benefited by radium. The patient must be a resident of the state and must be financially unable to pay for the medical services required.

Deaths

Dr. Adelbert D. Puterbaugh, Branford, aged 57, died November 11.

Dr. William L. Tull, Jacksonville, was found dead in bed at a hotel in Chattanooga, Tenn., December 14.

GEORGIA

The proposed cancer hospital and clinic at Grady Hospital, Atlanta, made possible by the $500,000 bequest of the late Albert Steiner, will be entirely apart from the control of the Hospital, and Charities Committee of the City Council, and will be supervised by the trustees for Mr Steiner. The estimated cost of the building is $100,000. It will be equipped with modern radium and roentgen ray furnishings at the cost of approximately $150,000.

Troup County Medical Society has elected the following officers: Dr. Wallace H. Clark, LaGrange, President; Dr. R. S. O'Neal, LaGrange, Vice-President; Dr. Enoch Callaway, LaGrange, Secretary-Treasurer; Dr. Henry R. Slack, LaGrange, delegate to the State Association.

The Lions Club, Atlanta, has elected Dr. E. C. Thrash general chairman of child welfare work. The program will call for the supervision of child health, recreation, saving, pleasure and education, and it is planned to make this work a national undertaking.

Drs. Ehrlich and Ehrlich, Bainbridge, has purchased some property owned by Judge Spooner and Dr. Berry, and will erect a large two-story brick building. The first floor will be used by Drs. Ehrlich and the second story will be made into offices.

Dr. W. H. Doughty, Augusta, has been reappointed as a member of the State Board of Health in the Tenth District.

Polk County Medical Society has elected the following officers: Dr. E. H. Richardson, President; Dr. P. O. Chaudron, Secretary-Treasurer; Dr. G. M. White, Vice-President.

The Sixth District Medical Society held its semiannual meeting at Macon, December 14.

Dr. W. I. Hailey, Hartwell, has been appointed a member of the State Board of Health in the Eighth District to succeed Dr. B. C. Teasley.

Dr. Lisle Benjamin Robinson, Atlanta, and Miss Effie May Buchanan, Nashville, Tenn., were married December 28.

Deaths

Dr. Louis C. Newman, Atlanta, aged 53, died November 30.

Dr. Jesse Ansley Griffin, Augusta, aged 49, was found dead in bed December 14, from heart disease, in Los Angeles, Cal.

Dr. John Raymond Middlebrooks, Powder Springs, aged 32, was killed December 10 in an automobile accident at Portsmouth, Va.

KENTUCKY

The City Council of Bowling Green has donated for hospital purposes two acres of land in Reservoir Park. A fund of $20,000 is on hand for the construction of a hospital, and a campaign to obtain an equal amount before building operations are begun will soon be under way.

The Scott County Health Department has moved its head office from the City Building, Georgetown, to South Hamilton Street, opposite the old post office building.

The Washington County Medical Society has elected the following officers: Dr. M. W. Hyatt, President; Dr. J. B. Overall, Vice-President; Dr. S. R. Boggess, Mackville, Secretary-Treasurer.

Harrison County Medical Society has elected the following officers: Dr. J. E. Wells, President; Dr. J. M. Rees, Vice-President; Dr. W. B. Moore, Secretary; Dr. B. B. Petty, Treasurer.

Harlan County Medical Society has elected the following officers: Dr. W. E. Riley, Lynch, President, to fill out the term of Dr. Jasper; Dr. J. E. Johnson, Harlan, to fill the unexpired term of Dr. R. J. Malott, Secretary-Treasurer.

Scott County Medical Society has elected the following officers: Dr. John E. Pack, President; Dr. A. B. Coons, Vice-President; Dr. W. N. Lipscomb, Secretary-Treasurer.

Hardin County Medical Society has elected the following officers: Dr. H. R. Nusz, President; Dr. R. T. Layman, Vice-President; Dr. D. E. McClure, Secretary-Treasurer.

Pike County Medical Society has elected the following officers: Dr. Z. A. Thompson, Pikeville, President; Dr. H. G. Stambaugh, Wolfpit, Secretary-Treasurer.

Fleming County Medical Society has elected the following officers: Dr. T. Ribelin, President; Dr. A. M. Wallingford, Jr., Vice-President; Dr. Charles W. Aitkin, Secretary-Treasurer.

The federal government has appropriated an additional $300,000 for the purpose of enlarging the bed capacity of the Soldiers' Sanitarium, Dawson Springs, from 500 to 1,000 beds. Seven of the thirteen new buildings at the sanatorium have been completed, and by April, 1922, it is expected that the hospital will be ready for occupancy.

Dr. Adaline Bell, who recently moved from Cynthiana to Hazard, lost her office equipment and household effects in a fire which destroyed a department store building December 12.

Deaths

Dr. William L. Lowder, McKinney, died November 24.

Dr. Albert E. Hitt, Louisville, aged 57, died December 15 at Punta Gorda, Fla., where he had gone for the winter.

Dr. Frederick Albert Langolf, Sr., Louisville, aged 49, died December 16.

Dr. Nathaniel L. Rogers, Wickcliffe, aged 58, died December 16 from chronic nephritis.

Dr. John J. Youtsey, Newport, aged 66, died December 7 following an operation.

Dr. George Owings Graves, Winchester, aged 94, died recently.

Dr. Francis Marion Bayes, Paintsville, aged 69, died December 17.

LOUISIANA

The Board of Commissioners of the Louisiana Hospital for the Insane, Pineville, has awarded the contracts for the erection of four buildings. Three of these will be dormitories to accommodate 110 patients each and the fourth a dining hall and assembly room. The buildings will cost $432,300.

Dr. C. Jeff Miller, New Orleans, was elected President of the Southern Surgical Association at its recent meeting in Pinehurst, N. C.

Fire damaged the laundry of the State Hospital for the Insane, Pineville, to the extent of about $3,000.

The Avoyelles Parish Medical Society has elected the following officers: Dr. C. Jeansonne, President; Dr. K. A. Roy, Vice-President; Dr. S. J. Couvillon, Secretary-Treasurer.

The East Feliciana Parish Medical Society has elected the following officers: Dr. A. F. Barrow, President; Dr. E. E. Evans, Vice-President; Dr. E. M. Toler, Secretary-Treasurer.

St. Tammany Medical Society has elected the following officers: Dr. A. G. Maylie, President; Dr. J. K. Griffith, Slidell, Vice-President; Dr. J. F. Buquoi, Covington, Secretary-Treasurer.

The City Board of Health, New Orleans, has authorized the establishment of free night clinics for men and women afflicted with communicable diseases. In the operation of these clinics the Board of Health expects the cooperation of the Child Welfare Association and the Anti-Tuberculosis League.

The Orleans Parish Medical Society has elected the following officers: Dr. Wm. H. Block, President; Dr. E. A. Fossier, First Vice-President; Dr. P. Graffagnino, Second Vice-President; Dr. T. A. Maxwell, Third Vice-President; Dr. Elizabeth Bass, Secretary; Dr. J. A. Lanford, Treasurer.

Dr. George Garrett McKellar, Couchwood, and Miss Lillian Smith, Northern Copiah, were married October 8.

Dr. Stephen W. Stafford and Miss Marie Aurore Tircuit, both of New Orleans, were married November 24.

Dr. Labasse Joseph Robin, New Orleans, and Miss Lydia de los Reyes, were married December 7.

Deaths

Dr. William Childs, Church Point, aged 72, died November 24 from pneumonia.

Dr. Charles M. Menville, Houma, aged 64, died December 29.

MARYLAND

The Department of Pharmacology in the Johns Hopkins University Medical Department has been subdivided to provide for carrying on a wider scope of work and a new division established, that of biophysics. This division will be in charge of Dr. Jan Stephanus Van der Lingen; Dr. Karl Schlaepfer, University of Zurich, Switzerland, has been appointed Associate in Surgery in the Medical School; Dr. Ernst Huber, University of Zurich, Switzerland, Associate in Anatomy.

At a tea given in honor of the second anniversary of the Babies' and Children's Clinic of the University Hospital, Dr. Howard A. Kelly presented the Clinic with a hand-carved bambino, a representation in art of the Infant Christ, which he brought from Florence, Italy.

The Federal Interdepartmental Social Hygiene Board has selected Mr. Alan Johnstone, Jr., Executive Secretary of the Maryland Social Hygiene Society, to give a series of health talks under the auspices of the health boards of the various states and the U. S. Public Health Service.

An endowment in perpetuity of $110,000 for the Department of Art as applied to medicine in the Johns Hopkins Medical School, has been given by an anonymous donor. The department was established in 1911 and each year since that time the same donor has provided funds for its maintenance.

Dr. William A. Fisher, Baltimore, has been awarded the Distinguished Service Medal for exceptionally meritorious and distinguished services in a position of great responsibility. Dr. Fisher served eighteen months with the American Expeditionary Forces as assistant to Dr. J. M. T. Finney, Baltimore.

Dr. George J. Heuer, Baltimore, Associate Professor of Surgery at the Johns Hopkins Medical School, has accepted the professorship of surgery in the Medical College of the University of Cincinnati.

Dr. Knight Dunlap, Professor of Experimental Psychology at the Johns Hopkins University, has been elected President of the American Psychological Association.

Col. Thomas R. Payne, U. S. Public Health Service, in command of Public Health Service Hospital No. 53, Fort McHenry, has been ordered to Staten Island, to take charge of U. S. Public Health Hospital No. 61, at Fox Hills.

Prominent citizens of Baltimore have started a movement to establish a tuberculosis preventorium for negro children in that city. They plan to erect the institution on land adjoining Morgan College. The Maryland Tuberculosis Association will supervise and handle the funds raised for this purpose.

MISSISSIPPI

On December 13th fire destroyed the King's Daughters' Infirmary, Gulfport. All patients were removed to places of safety. A new four-story brick building, with a capacity of 80 beds, is being constructed for the infirmary, at an estimated cost of approximately $100,000.

The LeFlore County Medical Society has elected the following officers: Dr. B. F. McNeal, Swiftown, President; Dr. J. P. Bates, Greenwood, Vice-President; Dr. W. B. Dickins, Greenwood, Secretary-Treasurer.

Dr. David Walley, Superintendent of the State Charity Hospital, Jackson, and a former captain in the regular army, stationed at Jackson Barracks in New Orleans, has been commissioned a Lieutenant-Colonel in the Medical Reserve Corps.

Drs. H. H. Kinney and D. F. Morgan have opened an infirmary in Okolona. The building is steam heated and is completely equipped for general hospital purposes. The infirmary has been designated as Emergency Hospital by the Mobile and Ohio and Southern Railroad Companies.

The Central Medical Society has reelected Drs. R. W. Hall and J. H. Fox, both of Jackson, President and Secretary, respectively. Other officers are as follows: Vice-Presidents: for Hinds County, Dr. C. L. Green, Utica; Rankin County, Dr. G. C. Russell, Finkbine; Madison County, Dr. E. A. Cheek, Canton; Simpson County, Dr. R. L. Simpson, D'Lo; Yazoo County, Dr. John L. Darrington, Yazoo City.

The Masonic Lodge of Brookhaven has given $1,000, and has agreed to furnish a room, for the new municipal hospital at Brookhaven.

Contracts have been awarded for the construction of five units of the State Tuberculosis Sanatorium, Magee.

The Harrison-Stone County Medical Society has elected the following officers: Dr. J. M. Kittrell, Gulfport, President; Dr. Coward Howison and Dr. S. C. Culpepper, Wiggins, Vice-Presidents; Dr. D. J. Williams, Secretary-Treasurer.

Deaths

Dr. Alcando A. Copeland, Belmont, aged 66, died November 29.

Dr. Reuben Thomas Greer, Malvina, aged 43, died December 5.

Dr. G. L. Terrill, Highpoint, aged 89, died at the home of his son, December 2.

Dr. Eugene Poole, Jackson, aged 69, died at the Baptist Hospital, December 25.

Dr. Charles B. Stephens, Shaw, aged 57, died October 3.

MISSOURI

The St. Louis Medical Society has announced it would treat, free of charge, crippled children of parents unable to pay and that free service in the City's best hospitals would be available to these unfortunates.

At a recent meeting of the State Board of Health, at Jefferson City, Dr. R. S. Vitt, former Coroner of St. Louis, was elected President, to succeed Dr. Emmet North. Dr. E. E. Bruner, Farmington, was elected Vice-President, and Dr. C. F. Enloe re-elected Secretary and State Health Commissioner.

Dr. Claud P. Fryer, Maitland, has been appointed County Health Officer for Nodaway County.

The Missouri State Board of Health has rescinded its order requiring state travelers to show a certificate of recent vaccination against smallpox.

Lawrence-Stone County Medical Society has elected the following officers: Dr. W. I. Fulton, President; Dr. J. W. Barker, Vice-President; Dr. R. C. Robertson, Secretary; Dr. W. S. Loveland, Treasurer.

Marion County Medical Society has elected the following officers: Dr. E. E. Waldo, Hannibal, President; Dr. Clyde W. Hamlin, Palmyra, Vice-President; Dr. Mary S. Ross, Hannibal, Secretary-Treasurer.

Wright-Douglas County Medical Society has elected the following officers: Dr. R. M. Norman, Ava, President; Dr. L. T. Van Noy, Norwood, Vice-President; Dr. A. C. Ames, Mountain Grove, Secretary-Treasurer.

Clinton County Medical Society has elected the following officers: Dr. O. E. Schoenfelt, Lathrop, President; Dr. J. T. Kimsey, Lathrop, Vice-President; Dr. M. L. Peters, Cameron, Secretary-Treasurer.

Henry County Medical Society has elected the following officers: Dr. J. R. Hampton, Clinton, President; Dr. Robert D. Haire, Clinton, Vice-President; Dr. F. M. Douglas, Clinton, Secretary-Treasurer.

The Ophthalmic Section of the St. Louis Medical Society announces a course of lectures in ophthalmology, to be given in St. Louis by Professor Ernst Fuchs, of Vienna, during the month of February, 1922. Further information regarding this course may be obtained by writing to the Fuchs Lecture Committee, St. Louis Medical Society, 3525 Pine St., St. Louis, Mo.

At a recent meeting of the Wabash Railway Surgeons' Association in St. Louis, Dr. G. W. Hawkins, Salisbury, was elected Vice-President.

The Missouri School for the Blind is having health crusade charts put into braille with a view to teaching hygiene and sanitation to the children in the grades. This will later be included in the high school courses for the blind.

The State Board of Health proposes to establish a health center in Sikeston and will furnish $10,000 to carry on the work one year if four of the seven counties represented at a meeting in this city will agree to give $1500 each, making a total of $16,000.

Recently a tract of ground 150 by 160 feet was purchased by St. John's Hospital, St. Louis, giving the Hospital control of an entire city block. Plans are being made to erect a building on the new property, at a cost of $500,000. When this is completed the total investment of buildings and grounds of the Hospital will amount to $2,000,000. One hundred milligrams of radium have been purchased, and pathological and x-ray laboratories have been installed.

At a recent meeting of the State Board of Eleemosynary Institutions, Dr. A. C. Vickery, St. Louis, was elected Superintendent of the State Hospital for the Insane at St. Joseph, and Dr. Porter Williams, who has been head of the St. Joseph institution was made superintendent of the State Hospital at Nevada, to fill the vacancy caused by the retirement of Dr. T. B. M. Craig, of Nevada.

At the thirty-first annual meeting of the Western Surgical Association held in St. Louis, December 9-10, the following officers were elected: Dr. Miles F. Porter, Fort Wayne, Ind., President; Dr. V. P. Blair, St. Louis, First Vice-President; Dr. J. Frank Corbett, Minneapolis, Second Vice-President; Dr. Warren A. Dennis, St. Paul, re-elected Secretary-Treasurer. Minneapolis was selected as the next meeting place.

Contracts have been let for the erection of a new building for the Missouri Pacific Hospital, St. Louis. The building is to cost $850,000 and will accommodate 270 white and thirty negro patients.

Deaths

Dr. Oscar N. Thompson, Breckenridge, aged 54, died November 25 at Keokik.

Dr. John S. Evans, Brookfield, aged 56, died December 21 after a short illness.

Dr. Stephen G. Smith, Hannibal, aged 76, died December 15.

Dr. Charles Edmund McBride, Webb City, aged 69, died December 29 from cerebral hemorrhage, while at the bedside of a patient.

Dr. Byron B. Potter, Lancaster, aged 74, died suddenly December 16.

Dr. John J. Rinehardt, Chaonia, aged 44, died December 8 at the St. Francis Hospital, Cape Girardeau, from septicemia, following the extraction of three teeth.

Dr. James Cowper Shelton, Chillicothe, aged 59, died December 5 at the Chillicothe Hospital from chronic nephritis and uremia.

Dr. Robert G. Keller,, Freeman, aged 55, died December 21 from smallpox.

Dr. James A. Melton, Aurora, aged 75, died suddenly January 8 from paralysis.

NORTH CAROLINA

At the recent meeting of the Southern Surgical Association at Pinehurst, the following officers were elected: Dr. C. Jeff Miller, New Orleans, La., President; Drs. Vilray P. Blair, St. Louis, Mo., and Robert L. Gibson, Charlotte, Vice-Presidents.

At a recent meeting of the Virginia Alumni Association held in Asheville, Dr. Chas. H. Cocke, Asheville, was elected President, and Dr. Roy E. Swartzberg, Vice-President.

Nash County Medical Society has elected the following officers: Dr. J. A. Winstead, Nashville, President; Dr. R. H. Noell, Vice-President; Dr. W. H. Dixon, Secretary; Dr. J. A. Speight, Treasurer.

Mecklenburg County Medical Society has elected the following officers: Dr. L. W. Hovis, President; Dr. H. W. McKay, Vice-President; Dr. J. L. Ranson, Secretary-Treasurer.

Davidson County Medical Society has elected the following officers: Dr. J. R. Terry, President; Dr. J. E. Hobgood, Vice-President; Dr. R. V. Yokley, Secretary-Treasurer.

Henderson-Polk County Medical Society has elected the following officers: Dr. E. P. Mallett, President; Dr. B.

(Continued on page 38)

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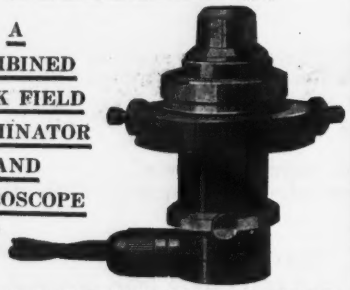

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(Continued from page 170)

F. Cliff, Vice-President; Dr. R. C. Sample, Secretary-Treasurer.

The following appointments have been made for the visiting staff of the State Hospital: Internal Medicine, Drs. R. B. Smith, Asheville; Leone B. Newell, Charlotte; Houston B. Hiatt, High Point; Samuel F. Pfhol, Winston Salem; S. S. Dodson, Greensboro, and Henry F. Glenn, Gastonia. Eye, Ear, Nose and Throat: Drs. Henry H. Briggs, Asheville; James P. Matheson, Charlotte; Robert V. Brawley, Salisbury; Thomas W. Davis, Winston-Salem, and John W. MacConnell, Davidson. These, with the following visiting surgeons, constitute the visiting staff for the Morganton Hospital: Drs. Addison G. Brenizer, Charlotte; John T. Burrus, High Point; W. F. Griffith, Asheville; Henry F. Long, Statesville; Henry Norris, Rutherfordton, and James E. Stokes, Salisbury. Dr. S. Westray Battle, Asheville, was appointed as a member of the State Geological Board.

The new hospital in connection with the Oxford Orphanage to be known as the Hicks Memorial Hospital will be constructed by the Masons in the State at a cost of $100,000.

Dr. Roy B. McKnight was recently appointed a member of the medical staff at Kenilworth Hospital, Asheville.

Drs. Bullock and Davis, Wilmington, have under construction a three-story brick building to be used as a private hospital. The hospital will have a bed capacity of 30.

Dr. Guy Kirby, Marion, has been elected President of the Tenth District Medical Society.

The Baptists of the state plan to finance the construction of a $113,000 hospital at Winston-Salem.

At a recent meeting of the Seaboard Medical Association, in Elizabeth City, the following officers were elected: Dr. Joseph L. Spruill, Sanatorium, President; Dr. George A. Caton, New Bern, Secretary; Dr. F. P. Cates, Manteo, Treasurer.

The District Nurse and Relief Committee of Greensboro presented a memorial tablet to the State Sanatorium for the Treatment of Tuberculosis, Sanatorium. This is in appreciation of the pioneer work of Dr. James E. Brooks, in his fight against tuberculosis in the state.

Dr. A. McR. Crouch announces the removal of his office from Wilmington to 108 W. Franklin Avenue, Gastonia. Practice limited to diseases and nutritional conditions of babies and children.

Dr. W. R. Kirk, Hendersonville, will replace his present office on the corner of Main and Fifth Streets with a modern three-story office and store building, to cost $50,000.

(Continued on page 40)

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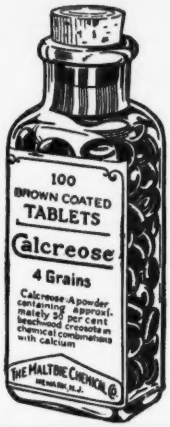

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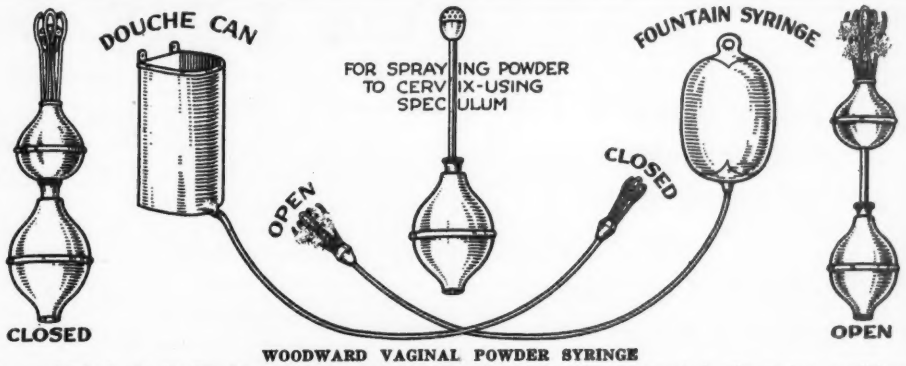

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(Continued from page 38)

While hunting, November 4, Dr. N. B. Cannady, Laurinburg, was accidentally shot in the right hand and face. The hand had to be amputated just above the wrist.

Dr. E. C. McClees, Elm City, and Miss Jane Bullock, Montgomery, Ala., were married December 29.

Dr. William Joseph Hunnicutt and Miss Nolan Knight, both of Asheville, were married January 3.

Dr. Irby Howard Hoyle, Henderson, and Miss Mildred Bryan Walton, Assumption, La., were married at Napoleonville, La., November 28.

Deaths

Dr. E. D. Mann, Saxapahaw, died November 20.

Dr. Louis McCormick, Asheville, died January 8 at the Biltmore Hospital as a result of eating poisoned fruit.

Dr. Newton Robinson, Elizabethtown, died December 19.

OKLAHOMA

Pottawatomie County Medical Society has elected the following officers: Dr. W. M. Gallaher, Shawnee, President; Dr. T. D. Rowland, Shawnee, First Vice-President; Dr. F. L. Carson, Shawnee, Second Vice-President; Dr. H. G. Campbell, Asher, Third Vice-President; Dr. T. C. Sanders, Secretary-Treasurer.

Tulsa County Medical Society has elected the following officers: Dr. R. W. Dunlap, President; Dr. W. W. Beesley, Vice-President; Dr. C. S. Summers, Secretary-Treasurer.

Okmulgee County Medical Society has elected the following officers: Dr. Ira W. Robertson, Henryetta, President; Dr. L. D. Conn, Morris, Vice-President; Dr. Franklin D. Howell, Okmulgee, Secretary-Treasurer.

Ottawa County Medical Society has elected the following officers: Dr. D. L. Connell, Pitcher, President; Drs. F. L. Wormington, Miami, R. H. Harper, Afton, H. K. Miller, Fairland, Vice-Presidents; Dr. G. Pinnell, Miami, Secretary-Treasurer.

Kay County Medical Society has elected the following officers: Dr. D. W. Miller, Blackwell, President; Dr. E. E. Waggener, Tonkawa, Vice-President; Dr. Howard S. Browne, Ponca City, Secretary-Treasurer.

Muskogee County Medical Society has elected the following officers: Dr. F. E. Waterfield, President; Dr. C. E.

(Continued on page 42)

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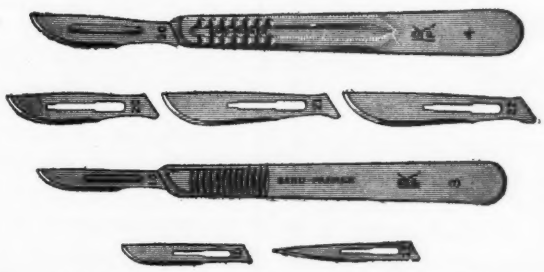

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(Continued from page 40)

DeGroot, Vice-President; Dr. Arthur L. Stocks, Secretary-Treasurer.

Several physicians of Ada have organized a Charity Clinic with the view of lessening suffering among the poor of the city. Children will be given first consideration. The Red Cross is helping in the new work. Applicants will be treated on Mondays and Thursdays.

Dr. James R. McLaughlin, Norman, has been appointed Superintendent of the Western Oklahoma Tuberculosis Hospital, Clinton.

Deaths

Dr. Sessler Hoss, Muskogee, aged 40, died December 29 from pneumonia.

Dr. John D. Fowler, Heavener, aged 49, died November 16.

Dr. R. T. Forbis, Hartshorne, aged 78, died December 11 from paresis.

Dr. Duncan D. Henderson, Caney, aged 46, died recently following an operation for appendicitis, at Sherman, Texas.

SOUTH CAROLINA

The Spartanburg County Medical Society has elected the following officers: Dr. R. H. Fike, President; Dr. Henry Workman, Woodruff, Vice-President; Dr. H. E. Heinitsh, Secretary; Dr. N. T. Clark, Treasurer.

The Sumter County Medical Society has elected the following officers: Dr. C. B. Epps, President; Dr. D. W. Green, Vice-President; Dr. H. L. Shaw, Secretary-Treasurer.

The State Medical Association will accept offers of an anonymous donor and the Woman's Auxiliary of Roper Hospital to install a maternity ward and a children's ward at Roper Hospital, Charleston. The improvements will cost $27,000.

Deaths

Dr. William G. Sexton, Spartanburg, aged 54, died at the home of his son, December 16.

Dr. William Simonton Pack, Greenville, aged 60, died December 12 following a long illness.

Dr. William Samuel Hutchinson, Anderson, aged 46, died recently after an illness of several weeks.

(Continued on page 44)

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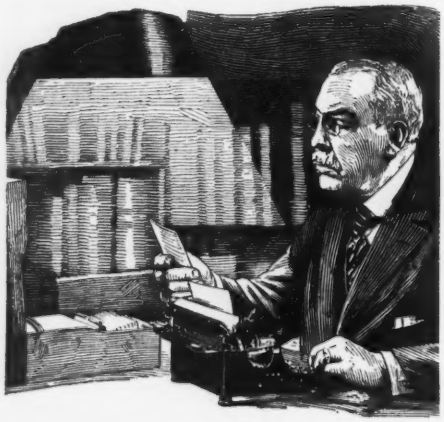

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(Continued from page 42)

TENNESSEE

The Washington County Medical Society has elected the following officers: Dr. H. M. Cass President; Dr. W. T. Kennedy, Vice-President; Dr. E. T. West, Secretary-Treasurer.

Memphis and Shelby County Medical Society has elected the following officers: Dr. Frank D. Smythe, President; Dr. Louis LeRoy, Vice-President; Dr. A. F. Cooper, Secretary; Dr. T. M. Coppedge, Treasurer.

The Weakley County Medical Society has elected the following officers: Dr. H. P. Stephen, Dresden, President; Dr. J. B. Bond, Martin, First Vice-President; Dr. J. Ernest Taylor, Latham, Second Vice-President; Dr. B. B. Parrish, Dresden, Secretary-Treasurer.

The Tipton County Medical Society has elected the following officers: Dr. H. C. Currie, President; Dr. L. J. Lindsey, First Vice-President; Dr. J. J. Fleming, Second Vice-President; Dr. J. F. Myers, re-elected Secretary-Treasurer.

Dr. Hilliard Wood, Nashville, for thirty years teaching ophthalmology and otolaryngology at the Vanderbilt University, has resigned. Dr. M. M. Cullom and A. G. Kennon will succeed him.

Dr. Thomas V. Woodring, Nashville, has been federally recognized as a Captain in the Medical Corps, Air Observation Squadron.

At the annual meeting of the State Association of Registered Nurses the following officers were elected: Mrs. D. T. Gould, Nashville, President; Mrs. George A. Blair, Knoxville, First Vice-President; Miss Katharine Andrews, Chattanooga, Second Vice-President; Miss Marie Peterson, Memphis, Secretary; Miss Mary Hathcock, Nashville, Treasurer.

Major W. E. Cooper, M. C., U. S. Army, Fort Bliss, Texas, has been detailed as Assistant Professor at Vanderbilt University, Nashville.

Dr. Solomon Winfred Prioleaux, Memphis, and Miss Ethel M. Weaver, Raleigh, N. C., were married November 10.

Deaths

Dr. Samuel A. Henderson, Jackson, aged 59, died December 14 from septicemia and malaria.

Dr. Riley W. Drinnon, Luther, aged 60, died recently from acute dysentery.

Dr. Lucullus Erwin Webb, St. Bethlehem, aged 66, died December 27 from paralysis.

Dr. Hugh Smith, Nashville, aged 44, died December 19.

TEXAS

Bell County Medical Society has elected the following officers: Dr. T. F. Bunkley, Temple, President; Dr. Edgar R. Borne, Holland, Vice-President; Dr. R. T. Wilson, Temple, Secretary-Treasurer, re-elected.

Tarrant County Medical Society has elected the following officers: Dr. L. A. Scruggs, President; Dr. Tom B. Bond, Vice-President; Dr. F. W. Francis, Secretary-Treasurer.

McLennan County Medical Society has elected the following officers: Dr. Ross Jones, President; Dr. W. L. Crosthwait, Vice-President; Dr. Boyd Alexander, Secretary-Treasurer.

Williamson County Medical Society has elected the following officers: Dr. J. R. Martin, Georgetown, President; Dr. Joseph F. Flinn, Hutto, Vice-President; Dr. W. G. Pettus, Georgetown, Secretary.

Kaufman County Medical Society has elected the following officers: Dr. P. C. Shands, Forney, President; Dr. J. M. Sanders, Scurry, Vice-President; Dr. B. J. Hubbard, Kaufman, Secretary-Treasurer.

Taylor County Medical Society has elected the following officers: Dr. J. M. Estes, President; Dr. L. J. Pickard, Vice-President; Dr. Stewart Cooper, Secretary-Treasurer, re-elected.

The Physicians' and Surgeons' Hospital, Dallas, was recently completely destroyed by fire, with a loss of $30,000; insurance is $20,000.

Work on the $75,000 nurses' home at the Central Baptist Sanatorium, Waco, will soon be begun. The building will be four stories high.

The North Texas Medical Association has elected the following officers at a meeting held in Dallas in December: Dr. James J. Terrill, Dallas, President; Dr. Charles A. Schultz, Alvarado, Vice-President; Dr. William S. Horn, Fort Worth, Secretary-Treasurer.

Construction work on the $1,000,000 Methodist Hospital, Dallas, has been started.

Dr. J. H. French, Greenville, has been elected County Health Officer of Hunt County, to fill the vacancy caused by the death of Dr. T. J. Milner.

(Continued on page 46)

The Prevention of Weak, Tender Feet

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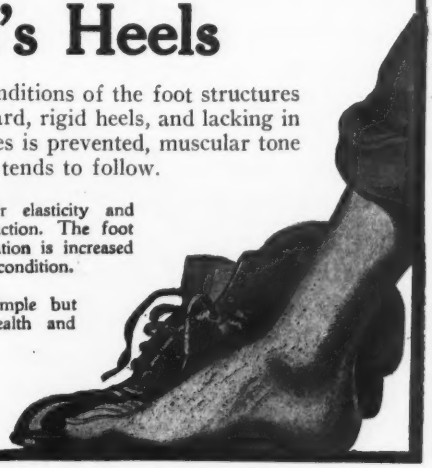

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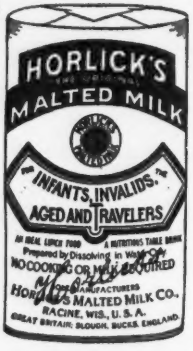

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(Continued from page 44)

Dr. John W. Neely, Terrell, has been appointed City Health Officer to succeed Dr. W. F. Alexander, resigned.

The City Tuberculosis Hospital, Houston, has opened a new negro unit which will accommodate twenty-five patients. The unit was built at a cost of $25,000 and is under the direction of Dr. A. E. Greer.

Dr. William T. Davidson, Director of Public Health of Dallas, has been appointed Assistant Epidemiologist of the Public Health Service.

Deaths

Dr. Nelson A. Olive, Waco, aged 61, died December 5 following a short illness.

Dr. George Washington Foster, Georgetown, aged 87, died November 28.

Dr. J. Trannie Smith, Dallas, aged 37, was shot and killed December 19.

Dr. Henry W. Waters, Montgomery, aged 49, died November 14 from angina pectoris.

Dr. Robert L. Douglass, Frisco, aged 67, died December 2 from enlargement of the heart.

Dr. Henry A. West, D'Hanis, aged 56, died November 19 from heart lesion and frontal sinusitis.

Dr. Henry A. Moseley, Dallas, aged 79, died December 30.

Dr. Stephen Beasley Longino, Sulphur Springs, aged 65, was instantly killed December 14 when the automobile in which he was riding was struck by the Katy passenger train.

Dr. Charles F. Rice, Gainesville, aged 41, died suddenly December 14 from heart disease.

Dr. Wilmer Amos Hadley, Friendswood, aged 39, died December 9.

Dr. Robert Orr, Marfa, aged 56, died November 18.

Dr. Harry M. Toner, Shelbyville, aged 57, died November 19 from chronic nephritis in a hospital in Austin.

Dr. Oscar Kreuger, San Antonio, aged 40, died November 9 following a long illness.

Dr. John A. Embry, Decatur, aged 73, died November 24 from pneumonia.

VIRGINIA

The Richmond Academy of Medicine and Surgery has elected the following officers: Dr. Jas. K. Hall, President; Dr. R. D. Garcin, First Vice-President; Dr. W. H. Craig, Second Vice-President; Dr. J. R. Blair, Third Vice-President; Dr. M. W. Peyser, re-elected Secretary.

Arlington County Medical Society has elected the following officers: Dr. F. J. Ready, Clarendon, President; Dr. W. C. Welburn, Ballston, Vice-President; Dr. B. H. Swain, Ballston, Secretary-Treasurer.

A gift of $10,000 has been made to the endowment fund of the Norfolk Protestant Hospital for the purpose of endowing two memorial cots, one in memory of Mrs. Louisa Taylor Letcher, formerly a generous supporter of the Hospital.

The Northern Neck Medical Association has elected the following officers: Dr. M. Oldham, Lancaster, President; Dr. B. A. Middleton, Emmerton, Vice-President; Dr. R. E. Booker, Lottsburg, Secretary-Treasurer.

Dr. H. A. Burke, Petersburg, has been made Senior Lieutenant in the Navy and has taken up his duties in the United States Naval Hospital at Norfolk.

The will of the late Charles A. West, of Lynchburg, provides that his entire estate, valued at $45,000, become the property of the Sheltering Arms Hospital.

The Seaboard Medical Society has elected the following officers: Dr. Joseph L. Spruill, Sanatorium, N. C., President;

(Continued on page 48)

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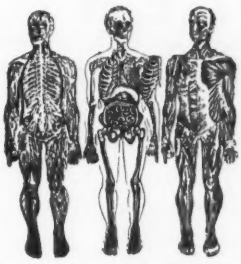

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(Continued from page 46)

Dr. Joseph T. Buxton, Newport News, First Vice-President; Dr. W. E. Warren, Williamston, N. C., Second Vice-President; Dr. Cora Z. Corpening, Suffolk, Third Vice-President; Dr. F. T. Gates, Manteo, N. C., Fourth Vice-President; Dr. Clarence Porter Jones, Newport News, re-elected Secretary; Dr. George A. Caton, New Bern, N. C., re-elected Treasurer.

Dr. Horace G. Longaker, Newport News, has been appointed Assistant Health Officer, succeeding Dr. M. W. Sinclair, resigned.

Dr. John A. Shackelford and Miss Margaret Dillard Spencer, both of Martinsville, were married November 16.

Dr. Charles Walker Pulney, Darlington Heights, and Miss Louise Anne Gathright, Richmond, were married December 3.

Deaths

Dr. Dirk Adrian Kuyk, Richmond, aged 57, died December 16 from influenzal pneumonia.

Dr. M. C. Keith, Pedlars Mills, aged 84, died December 12 from heart disease.

Dr. H. Donald Scott, Monroe, aged 65, died suddenly December 28.

WEST VIRGINIA

The Belmont County Medical Society has elected the following officers: Dr. F. S. Wright, Bellaire, President; Dr. F. R. Dew, Barnesville, Vice-President; Dr. J. S. McClelland, Bellaire, Secretary-Treasurer.

Dr. Kent Royal, formerly with the Sheltering Arms Hospital, Hansford, is now at Welch Hospital No. 1, Welch.

Dr. John Casson Geiger, Huntington, and Miss Anna E. Morse, New York, N. Y., were married November 25.

Deaths

Dr. Elsha W. Holly, Hamlin, aged 70, died November 30.

Dr. Daniel Castillo Graham, aged 32, died October 22 at St. Lukes Hospital, Bluefield.

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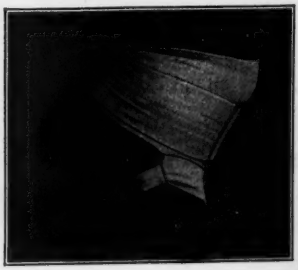

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